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BOTANICAL LEAFLETS

A series of studies in the systematic botany of miscellaneous dicotyledonous plants

by

EARL EDWARD SHERFF

RESEARCH ASSOCIATE IN SYSTEMATIC BOTANY
Chicago Natural History Museum

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PREFACE

The present series of nine "Botanical Leaflets" was begun in 1950. The edition in each case consisted of four hundred copies. These leaflets were employed as a convenient and more direct means of presenting the results of my researches in the herbarium and library than would have been possible through the ordinary botanical journals. Complete freedom from classroom duties during most of the time since then has permitted the monographic or otherwise revisional study of a large assortment of plants, many of which will be found mentioned within the included pages. My return now to teaching will preclude, however, the continuation of such study. It is not contemplated, therefore, to issue further leaflets of the series. Hence the nine now published may well be bound into a single volume before individual numbers get misplaced or lost (replacements cannot be assured indefinitely).

The work detailed was carried on largely at the Chicago Natural History Museum, where every facility was afforded, particularly in the matter of borrowing specimens from various European and American herbaria. To the authorities of that Museum and more especially Dr. Theodor Just, its Head Curator of Botany, it is a pleasure to express here my deepest gratitude.

A list of *errata* will be found before the Index at the end of Leaflet no. 9.

Chicago, Illinois E.E.S.
January 9, 1954.

IMPORTANT NOTICE

This Botanical Leaflet No. 1 is not an author's separate or reprint. IT IS AN ORIGINAL PUBLICATION, of which an edition of 400 copies was printed for distribution to various institutions and individuals. Its importance consists chiefly in the fact that it is the place of original publication for 13 new varietal plant names, in accordance with the present International Rules of Botanical Nomenclature.

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BOTANICAL LEAFLETS

(*Published by the author*)

Number 1 | Chicago, Illinois | May 24, 1950

A preliminary paper on the genus Nototrichium (A. Gray) Hillebr. (fam. Amaranthaceae)

By Earl Edward Sherff

The genus *Nototrichium,* endemic to the Hawaiian Islands, has been studied monographically by the writer and, later on, a detailed revisional treatment will be published. The manuscript of that treatment includes a number of new varieties and most of these are given advance publication in the present paper.

Nototrichium sandwicense typicum var. nov.; **Nototrichium sandwicense** (A. Gray) Hillebr. Fl. Haw. Isls. 373. 1888 *(sensu stricto).*

Nototrichium sandwicense leptopodum Degener & Sherff, var. nov.—Folia tenuissime petiolata petiolo plus minusve 2 cm. longo; lamina valde membranacea, nunc late ovata vel oblongo-ovata nunc subovata, apice obtusa vel parce subacuminata, usque ad circ. 3-4 cm. longa et circ. 2-3 cm. lata. Spica plus minusve 1 cm. longa. Type: *Otto Degener* 19,341, a 5-foot twiggy shrub, on *aa* lava waste, Nakaohu, Isl. Maui. Dec. 23, 1948 (Herb. Chicago Nat. Hist. Mus.).

Nototrichium sandwicense Syringifolium var. nov.—Folia (unici ramuli visi) tenuiter petiolata petiolo vix marginato plus minusve 1.5 cm. longo; lamina valde membranacea, late ovata, basi late truncata vel subcordata, apice eleganter acuminata, plus minusve 7.5 cm. longa et plus minusve 4.8 cm. lata. Spica sub 1 cm. longa. Type: *William Hillebrand,* Hawaiian Isls. (herb. Hooker in Herb. Kew).

Nototrichium sandwicense macrophyllum var. nov.—Folia principalia plerumque magna, petiolo tenui submarginato plus minusve 2 cm. longo; lamina membranacea, anguste ovata, basi rotundata vel late cuneata, apice acuta acuminatave, saepe 8-11 cm. longa et plus minusve 5.5 cm. lata. Spica nunc (pro typo) 1-1.5 nunc usque ad 2.7 cm. longa. Type: *G. W. Russ,* shrub 15 feet tall, hot dry old *aa* flow, alt. 125 feet, between Hilea and Honuapo, Goat Road, Kau, Isl. Hawaii, June 3, 1927 (Herb. Bishop Mus.).

Nototrichium sandwicense lanceolatum var. nov.—Aspectus apertus laxusve, foliis parvis, petiolo tenui circ. 5-10 mm. longo; lamina saepius lanceolata, membranacea, utrinque attenuata, apice acuta vel acuminata, 2.5-3.5 cm. longa et saepius 0.7-1.4 cm. lata. Spica 1-3 cm. longa. Type: *J. F. Rock* 12,973, Puuwaawaa, Kona, Isl. Hawaii, August, 1917 (Herb. Bishop Mus.).

Nototrichium sandwicense latifolium var. nov.—Saepe magis argenteum. Folia tenuiter petiolata petiolo sub 2 cm. longo; lamina membranacea, late ovata, basi latissime cuneata, apice moderate vel subabrupte acuminata, saepius 5-7 cm. longa et 3.5-4.8 cm. lata. Spica saepius 2-3.3 cm. longa. Type: *Rock & Hammond* 8,117, Maunalei Gorge, Isl. Lanai, July 30, 1910 (Herb. Gray).

Nototrichium sandwicense lanaiense var. nov.—Folia valde velutina, petiolo tenui plus minusve 1 cm. longo; lamina nunc rotundato-ovata nunc ovata vel obovata, basi late cuneata, apice obtusa vel subacuta, saepius 3-7 cm. longa et 2.5-4 cm. lata (pro ramulis sterilibus etiam ad 11 cm. longa et 6 cm. lata). Spica 1.5-3.3 cm. longa. (Varietati *kauaiensi* affine.) Type: *C. N. Forbes* 155-*L*, tree 9 feet tall, densely bushy at top, in dry forests, west end of Isl. Lanai, June, 1913 (Herb. Bishop Mus.).

Nototrichium sandwicense subcordatum Degener & Sherff, var. nov.—Folia minima, ad ramulorum apices conferta, petiolo complanato 4-8 mm. longo; lamina ovato-subcordata, basi latissime cuneata vel truncata (vix subcordata), apice acuta vel plus minusve acuminata, tantum 1.5-2 cm. longa et 1-1.5 cm. lata. Spica 1-2 cm. longa. Type: *Otto Degener* 9,873, about 17 miles from Kohala toward Waimea, Isl. Hawaii, Aug. 13, 1926 (Herb. New York Bot. Gard.).

Nototrichium sandwicense Helleri var. nov.—Folia numerosa, argentea vel cinerea, breviter (2-3 mm.) petiolata vel subsessilia; lamina elliptico-lanceolata, utrinque cuneate attenuata vel apice raro subacuminata, 3-4.5 cm. longa et plerumque 1-1.3 cm. lata. Spica plus minusve 1 cm. longa. Type: *A. A. Heller* 2,831 *pro parte*, on Kaholuamanu, above Waimea, Isl. Kauai, Sept. 24-30, 1895 (Herb. Chicago Nat. Hist. Mus.).

Nototrichium sandwicense kolekolense var. nov.—Folia petiolata petiolo tenui vel submarginato 5-12 mm. longo; lamina parva, diverse ovali ovata obovata vel subrotundato-ovata, basi cuneata, apice obtusa vel rotundata, ple-

rumque 2-2.5 cm. longa et 1.4-1.8 cm. lata. Spica circ. 1-1.5 cm. longa. Type: *C. N. Forbes* 179-*Mo*, on slopes of Puu Kolekole, Isl. Molokai, July, 1912 (Herb. Chicago Nat. Hist. Mus.).

Nototrichium humile typicum var. nov.; *Nototrichium humile* Hillebr. Fl. Haw. Isls. 373. 1888 *(sensu stricto)*.

Nototrichium humile subrhomboideum var. nov.—Folia tenuia, petiolo angusto 7-12 mm. longo, lamina oblonge subrhomboideo-lanceolata, basi cuneata, apicem subacutam versus sensim angustata, 3-6.5 cm. longa et 1.2-3 cm. lata. Type: *L. H. MacDaniels* 933, tree or bush 12 feet tall, on dry slope, alt. 1,300 feet, Mt. Kaala Trail from Schofield Barracks. Waianae Mts., Isl. Oahu. Aug. 14, 1927 (Herb. Bishop Mus.).

Nototrichium humile parvifolium Degener & Sherff, var. nov.—Varietati *subrhomboideo* similis sed foliis parvis petiolo 3-6 mm. longo lamina plerumque 1.5-3 cm. longa et sub 1.5 cm. lata differt. Type: *Otto Degener* 8,665, growing 5 feet tall, on dry cliff not far from Kolekole Pass, west branch of Waianae Valley, Isl. Oahu, Apr. 26, 1931 (Herb. Chicago Nat. Hist. Mus.).

IMPORTANT NOTICE

This Botanical Leaflet No. 2 is not an author's separate or reprint. IT IS AN ORIGINAL PUBLICATION, of which an edition of 400 copies was printed for gratuitous distribution to various institutions and individuals. Its importance consists chiefly in the fact that it is the place of original publication of various critical notes, with descriptions of certain new species and varieties of plants.

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BOTANICAL LEAFLETS

(*Published by the author*)

Number 2 Chicago, Illinois October 16, 1950

Notes on certain members of the Amaranthaceae, Caryophyllaceae, Euphorbiaceae and Compositae.

By Earl Edward Sherff

Nototrichium sandwicense Forbesii var. nov.—Folia numerosa, parva, petiolo tenui vel vix submarginato 5-8 mm. longo; lamina rhomboideo-ovata vel raro-subobovata, basi cuneata, apice obtusa vel rarius acuta, plerumque 2-3.5 cm. longa et 1.2-2.2 cm. lata, infra valde argentea vel fulvo-argentea. Spica elongato-cylindrica, 2-4.5 cm. longa. Specimens examined: *Charles N. Forbes* 3-*Mo*, Mauna Loa, Isl. Molokai, Haw. Isls., June, 1912 (type, Herb. New York Bot. Gard., my photograph no. 4,050: isotypes, Herb. Bishop Mus.; Herb. Missouri Bot. Gard., my photogr. no. 3,949; etc.); *George C. Munro*, Papohaku, Isl. Molokai, 1920 (Herb. Bish. Mus.).

Nototrichium sandwicense decipiens var. nov.—Folia breviter petiolata petiolis tenuibus ad marginatis et tantum 1-4 mm. longis; laminis plerumque obovatis (paucis ovalibus ad elliptico-oblongis), basi cuneatis ad rotundato-cuneatis, apice obtusis ad rotundatis, plerumque 1-2 (raro usque ad fere 4) cm. longis et 7-17 mm. latis, pubescentia densa fulvo-cinerea velutina, venis infra plerumque elevatis. Spicae (tantum paucae visae) sub 1 cm. longae. Specimens examined: *A. A. Heller* 2,831 *pro parte* (*cum var. Helleri commixt.*), erect compact bush 3-4 feet tall, on open exposed slope, about 2,500 feet alt., on ridge up to Kaholuamanu, between forks of Waimea River, Isl. Kauai, Haw. Isls., Sept. 24, 1895 (type, Herb. U. S. Nat. Mus., my photograph no. 4,055: isotypes, Herb. Bishop Mus.; Herb. Missouri Bot. Gard., my photograph no. 4,057; Herb. New York Bot. Gard., 2 sheets, my photograph no. 4,056).

Nototrichium sandwicense dubium var. nov.—Folia cordato-ovata, petiolo complanato marginatoque usque ad 12 mm. longo; lamina sub 5.5 cm. et 3.7 cm. lata, apice moderate acuminata basi rotundata vel subtruncata (forsitan interdum parce subcordata). Spicae stramineae, sub 1.2 cm. longae, floribus paucioribus crassioribus hispidioribusque. Specimens exam-

ined: *C. N. Forbes* 1,816-*M*, shrub, only one seen, densely branched, 3 feet tall, . . . leaves silvery-pubescent below, light green with a suggestion of yellow above, branches somewhat silvery-gray, on side of a gulch, Manawainui, south slope of Haleakala, southeastern East Maui, Haw. Isls., Mar. 3, 1920 (type, Herb. Bishop Mus., my photograph no. 4,059).

Nototrichium sandwicense pulchellum var. nov.—A specie ipsa foliis minoribus (lamina plerumque tantum 1.5-3 cm. longa et 1-2.5 cm. lata) et apice acutis vel parce acuminatis differt. Spicae sub 2 cm. longae. Specimens examined: *Joseph F. Rock*, Mahana, western Molokai, Haw. Isls., February, 1910 (type, Herb. Gray, my photograph no. 4,058: isotypes, Herb. Bishop Mus.; Herb. New York Bot. Gard.).

Nototrichium sandwicense olokeleanum var. nov.—Folia marginato-petiolata petiolo 4-8 mm. longo; lamina subrhomboide vel oblonge ovata utrinque tomentulosa, infra albido-cinerea et elevato-venata, supra fusciore, basi cuneata, apicem subacutum acuminatumve versus subsensim attenuata, plerumque 3-6.5 cm.longa et 1.3-3 cm. lata. Pedunculi subvalidiores, plus minusve fastigiate disposita, elongatiores (saepe usque ad 7.5 cm. longi). Spicae 1-3 cm. longae. Specimens examined: *J. F. Rock* 5,422, Olokele Canyon, Isl. Kauai, Haw. Isls., September, 1909 (type, Herb. Gray, my photograph no. 4,064: isotype, Herb. Bishop Mus., my photograph no. 4,065).

Nototrichium sandwicense mauiense Degener & Sherff, var. nov. — Ramuli foliaque dense luteo-tomentulosa, petiolis subtenuibus 3-7 mm. longis, laminis ovatis; foliorum principalium usque ad 3.5 cm. longis et ad 2 cm. latis, basi late cuneatis vel rotundatis, apice acutis vel subacuminatis, venis infra elevatis crassiusculisque. Specimens examined: *Otto Degener & Henry Wiebke* 3,341, arid region near cliff, from Papawai Point toward Puu Anu through Manawainui Gulch, West Maui, July 12, 1927 (type, Herb. New York Bot. Gard., my photograph no. 4,061).

Nototrichium viride oblongifolium var nov.—Foliorum laminae plerumque oblongae rarius subrhomboideo- vel ellipticooblongae sub 6 cm. longae et 2.5 cm. latae; pedunculis gracillimis atque elongatioribus interdum 5-7 cm. longis; spicis submaturis usque ad 1.6 cm. longis. Specimens examined: *Faurie* 1,070, in rocky places of the mountains, Waimea, Isl. Kauai, Haw. Isls., March, 1910 (type, Herb. Delessert, my photograph no. 4,062: isotype, Herb Bishop Mus., my photograph no. 4,063).

Nototrichium viride subtruncatum var. nov.—Folia basi latissime cuneata vel etiam truncata. Spicae ovoideae, sub 1 cm. longae. Bracteae laterales paulo magis subulato-caudatae. Type: *G. W. Russ*, Kawaihapai, Isl. Oahu, Haw. Isls., March, 1932 (Herb. Bishop Mus.).

Schiedea ligustrina Cham. & Schlecht. × **S. Hookeri** var. **acrisepala** Sherff, a new hybrid. — Recently Degener, Hatheway, & Carroll collected a suite of typical specimens of *Schiedea ligustrina*, Degener's distrib. no. 20,617, in northwestern Oahu, Haw. Isls.: exposed, grassy, precipitous slope, alt. 1,700 feet, gulch southwest of Dillingham Ranch, Mokuleia, Apr. 23, 1950 (Herb. Chicago Nat. Hist. Mus. etc.). On the same date, among rocks in shaded gulch at same locality, they collected a large suite of typical *S. Hookeri* var. *acrisepala*, Degener's distrib. no. 20,618 (Herb. Chicago Nat. Hist. Mus. etc.). Growing with the latter and near no. 20,617, they obtained a third suite of specimens (Degener's distrib. no. 20,619, (Herb. Chicago Nat. Hist. Mus. etc.) definitely intermediate and clearly of hybrid nature (as in fact stated by Degener on some of the labels).

Euphorbia Forbesii Sherff, Bot. Gaz. 97: 582. 1936; *E. Clusiaefolia* var. *grandifolia* Hillebr. Fl. Haw. Isls. 395. 1888. —Hillebrand's *E. Clusiaefolia* var. *grandifolia* came from "Makaleha in the Kaala range" of Oahu, as previously stated by me in 1937 (Ann. Mo. Bot. Gard. 25: 13). His type (since lost in the destruction, by war, of the Berlin Herbarium) was a lone sterile branch, referable either to *E. Forbesii* Sherff or to *E. Rockii* Forbes. Very recently I have been sent two excellent suites of material from what amounts essentially to a topotype of Hillebrand's variety. These came from the same habitat on the same date, and are seen to belong definitely to *E. Forbesii* of northwestern Oahu rather than to *E. Rockii* of northeastern Oahu. The involucral glands are seen to be yellowish-brown on their inner face, the immature fruit white with bright-red *carinae* and on a pubescent stipe. Specimens examined: *Degener et al.* 20,699, up to 15 ft. tree with few spreading-drooping branches; unripe fruit white. . . . in partly shaded gulch, east branch of Makaleha Valley at alt. 2,500 feet, Isl. Oahu, Haw. Isls., July 30, 1950 (Herb. Chicago Nat. Hist. Mus. etc.); *William Hatheway et al.* 125, slender tree 15 feet tall, trunk 1.5 inches thick at breast height. . . . talus slope of canyon, open places in moist forest of *Diospyros ferrea*, *Alectryon Mahoe*, etc., east branch of East Makaleha Stream, alt. 2,500 feet, Isl. Oahu, July 30, 1950 (Herb. Chi. Nat. Hist. Mus. etc.).

Coreocarpus Alexandrae sp. nov.—Herba annua, subglabra, suberecte ramosa, caule ramisque angulatis sulculatisque, internodiis 3-7 cm. longis. Folia principalia petiolata petiolo plus minusve marginato plus minusve 1.5 cm. longo; lamina bipinnatisecta, 2-3 cm. longa, membranacea, multipunctulata, segmentis primariis 3 vel 5, lobis lineari-oblongis ad rhomboideo-cuneatis apice breviter mucronulatis, margine plus minusve ciliatis, faciebus glabratis vel infra aegre hispidulis. Capitula tenuissime pedunculata pedunculo usque ad 6 cm. longo, numerosa (plus minusve 50), sine floribus ligulatis, ad anthesin circ. 6-8 mm. lata et circ. 4-6 mm. alta, saepe bracteola minuta lineari subulatave subtenta. Involucrum glabratum, bracteis exterioribus circ. 5, plerumque 3-4 mm. longis, anguste diaphano-marginatis et praecipue supra ciliatis. Flores tubulosi supra annulum squamelliformi-setosum flavi, corollae tubo virides. Achaenia (alis inclusis circ. 2 mm. lata) corpore nigra 2.5-2.8 mm. longa et plus minusve 1.2 mm. lata, obcompressa, anguste cuneato-obovata, dorsaliter papillata vel breviter setulosa ventraliter valdius setulosa; alis pectinatis, stramineo-albis; aristis plerumque 2, brevissimis, retrorsum hispidulis. Specimens examined: *William & Ellen Massey* 48, Buena Vista (23 miles north of El Refugio), Llanos de Magdalena, Distrito del Sur, Baja California, Mexico, Oct. 17, 1949 (type, Herb. Chicago Nat. Hist. Mus., my photograph no. 4,032).

This species, the type of which was sent me by Miss Annetta Carter, Senior Herbarium Botanist at the University of California, differs from the other nine species of *Coreocarpus* in having diskoid heads. The type locality, Buena Vista, is estimated by Mr. Massey at about 25° 5′ N. Lat. and 111° 45′ W. Long. Mr. Massey's stay in Baja California in the summer and fall of 1949 was made possible by Miss Annie M. Alexander, (who, with Miss Louise Kellogg, has made extensive botanical collections in various little known parts of the west for the past fifteen years, and) after whom the species is named.

Dahlia Macdougallii sp. nov.—Caulis tenuis, basim versus forsitan lignosus, plus minusve 9 (fide lectoris forsitan etiam usque ad 18) m. altus itaque interdum arbores superans. Folia superiora (alia non visa) impari-pinnata, petiolo tenui 5-8 cm. longo, fere glabro, foliolis membranaceissimis, acerrime serratis, supra vix nisi secundum venas hispidulis infra moderate adpresso-pilosis, lateralibus 2 jugis ovato-lanceolatis apice elongate acuminatis caudatisve basi nunc (inferioribus) tenuiter petiolulatis nunc (superioribus) sessilibus, laminula circ. 12-13.5

cm. longa et 3.5-5 cm. latis, foliolo terminali simili sed magis rhomboideo. Inflorescentia paniculata plus minusve 5 dm. longa lataque, plus minusve 20-capitulata. Capitula tenuiter pedunculata pedunculo plus minusve 1 dm. longo, radiata, pansa ad anthesin circ. 10-12 cm. lata. Involucri extus glabri bracteae exteriores plerumque 5 raro 6, anguste lineares, plurisulculatae, apicem versus sensim angustatae, intus adpresse fulvo-setosae, 1-1.6 cm. longae; interiores latiores, paulo longiores. Flores ligulati 8, albi; ligula elliptico-oblonga vel anguste obovata, apice angustato acuta, 4-5 cm. longa et 1.5-2 cm. lata. Paleae demum lanceolato-oblongae, diaphanae, 2-2.5 cm. longae et circ. 7-8 mm. latae, apice subobtuso obsolete denticulato. Flores tubulosi flavi. Achaenia brunneo-atra, anguste cuneato-linearia, obcompressa, longitudinaliter sulculata, 7-9 cm. longa; apice ipso saepe paulo latiore, calloso, limbo interdum revoluto, media parte interdum poculata, aristis dentibusve absentibus. Specimens examined: *Mr. T. MacDougall*, alt. 7,000-7,500 feet, rain-forest above town of Santo Tomas Teipan, Oaxaca, Mexico, November, 1949 (type, Herb. Chicago Nat. Hist. Mus., my photograph no. 4,053: isotype, Herb. Chi. Nat. Hist. Mus., my photograph no. 4,054).

Heterosperma Xantii Carterae var. nov.—A specie foliis caulibus ramisque fere omnino puberulis differt. Specimens examined: *Annetta Carter* 2,633, plants decumbent, pubescent; ray and disk flowers yellow; under shrubs; sparse, low *Foquieria, Jatropha, Mimosa* association; broad arroyo and eroded, granitic, north-facing slope, 26.5 km. southeast of La Paz on road to Los Planes, lat. 24° 2.5′ N., Long. 110° 8′ W., Distrito del Sur, Baja California, Mexico, Apr. 3, 1949 (type, Herb. Chicago Nat. Hist. Mus., my photogr. no. 4,033).

Bidens fulvescens indivisa Degener & Sherff, f. nov.—Folia indivisa, lamina oblongo-lanceolata 5-9 cm. longa et circ. 2-3 cm. lata. Specimens examined: *Degener & Murashige* 19,742, single plant growing with compound-leaved plants, Pohakea Pass, Isl. Oahu, Haw. Isls., July 17, 1949 (type, Herb. Chicago Nat. Hist. Mus., my photogr. no. 4,034; isotypes, Herb. Bishop Mus.; Herb. Gray; etc.).

Bidens serrulata Sharpii var. nov. — Debilior, foliis 2-3-pinnatis segmentis linearibus vel paulum latioribus. Involucri bracteae exteriores saepe 12-16, angustissime lineares et sursum sensim attenuatae, sub 8 mm. longae. Specimens examined: *George B. Hinton et al.* 15,256, Sierra Torricillas, Distr. Coalcoman, State of Michoacan, Mexico, Oct. 4, 1939 (Herb. Chicago Nat. Hist. Mus.); *Aaron J. Sharp* 441,584, yellow rays with red-dish-brown base, alt. 6,600 ft., river bottom near Omiltemi, State of Guerrero, Mexico, Oct. 28, 1944 (type, Herb. Chi. Nat. Hist. Mus., my photogr. no. 4,052).

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BOTANICAL LEAFLETS

(*Published by the author*)

Number 3 Chicago, Illinois March 9, 1951

Notes upon certain new or otherwise interesting plants of the Hawaiian Islands and Colombia

By Earl Edward Sherff

The plants treated in this paper belong to the families Amaranthaceae (*Nototrichium* [Gray] Hillebr.), Caryophyllaceae (*Alsinodendron* H. Mann), Pittosporaceae (*Pittosporum* Banks), Euphorbiaceae (*Euphorbia* L.), Loganiaceae (*Labordia* Gaud.), Labiatae (*Phyllostegia* Benth.), and Compositae (*Bidens* L.).

Nototrichium sandwicense pulchelloides Degener & Sherff, var. nov.—Frutex varietati *pulchello* similis sed foliis tenuioribus, lamina pro majoribus basi rotundata subtruncatave, nervis principalibus brunneo-stramineis saepe imperfecte glabratis differt. Specimens examined: *Otto Degener* 9,869, only a few plants seen, in last relic of arid forest, on cliff, near Waiahewahewa Gulch, West Molokai, Apr. 18, 1928 (type, Herb. New York Bot. Gard., my photograph no. 4,077). The type locality is just southeast of and very close to Mahana, the type locality of *N. pulchellum* Sherff, but var. *pulchelloides* seems sufficiently distinct in the characters above noted.

Alsinodendron obovatum, sp. nov.—Frutex glaber, pallidus, infra ligneus, ramulis herbaceus, internodiis demum teretibus saepius 1.5-5.5 cm. longis. Folia opposita, petiolata, petiolo tenuiter alato 1.2-2.3 cm. longo; lamina plus minusve obovata, triplinervia, vix membranacea, integra vel (praecipue apicem versus) minutissime obscurissimeque calloso-denticulata denticulis apice saepe spinula minutissima antrorsaque munitis, infra in petiolum attenuata, apice plerumque obtuso vel rotundato abrupte mucronulata, usque ad 8 cm. longa et ad 5 cm. lata. Inflorescentia terminalis, glabra, cymosa, foliis multum superata, saepius 2-3-composita, plerumque 3-9-flora, pedicellis filiformibus arcuatis 1.3-2.6 cm. longis. Sepala late oblonga obovatave ad anthesin viridia, hyalino-marginata, plurinervata, circ. 6-7 mm. longa; demum atropurpurea vel subnigra, usque ad 1 cm. longa. Capsula ovoidea globosave, nitida, castaneo-brunnea, plus minusve 1.2 cm. longa, demum in 7 valvas fissa. Semina orbiculari-reniformia, plana, nigra, faciebus

(saltem pro maxima parte) sublaevia, marginibus conspicuissime rugosa rugis saepe poculis similibus, circ. 1.5 mm. longa. Specimens examined: *Charles Noyes Forbes* 1,680-*O*, Palehua (21° 24′ N. Lat., 158° 6′ W. Long.), Waianae Range, southwestern Oahu, Apr. 1-4, 1911 (type, Herb. Chicago Nat. Hist. Mus., my photograph no. 4,066).

Distinguished at once from *A. trinerve* H. Mann of Mt. Kaala in northwestern Oahu by its thicker, obovate, blunt-tipped, and a third shorter leaf-blades; its less decompound and fewer-flowered cymes, its longer and more filiform pedicels, its more conspicuously wrinkled seed-margins (these with numerous fancifully shaped, often poculate or nidulate depressions), etc.

Alsinodendron obovatum parvifolium Degener & Sherff, var. nov.—Foliorum laminae nunc elliptico—oblongae nunc saepiusque obovatae vel interdum late oblanceolatae tantum 3-5.5 cm. longae et 1.5-3 cm. latae. Capsulae seminaque paulo minora. Specimens examined: *Degener, Greenwell, Hatheway, & Caindec* 20,675, in shrubby tangle at 2,500 feet altitude, summit ridge between Puu Manawahua and Mauna Kapu, southwestern Oahu, June 28, 1950 (type, Herb. Chicago Nat. Hist. Mus., my photograph no. 4,067: also 12 as yet undistributed isotypes).

Until such time as a monographic revision becomes available, it will doubtless be of assistance to workers upon the Hawaiian flora to have the following

Conspectus of the now known entities in Alsinodendron

Alsinodendron viscosum (H. Mann) Sherff, Amer. Journ. Bot. 31: 155. 1944; *ibid.* 36: 501. 1949. Isl. Kauai, Hawaiian Isls.

Alsinodendron viscosum var. *laeve* Sherff, *op. cit.* 31: 157. Isl. Kauai.

Alsinodendron Lychnoides (Hillebr.) Sherff, *loc. cit.* Isl. Kauai.

Alsinodendron verticillatum (F. Brown) Sherff, *loc. cit.* Isl. Nihoa, Leeward Isls.

Alsinodendron trinerve H. Mann, Proc. Boston Soc. Nat. Hist. 10: 311. 1866. Mt. Kaala, Isl. Oahu, Hawaiian Isls.

Alsinodendron obovatum Sherff (*supra*). Southwestern Oahu.

Alsinodendron obovatum var. *parvifolium* Deg. & Sherff (*supra*). Southwestern Oahu.

Pittosporum cladanthum Sherff, Amer. Journ. Bot. 28: 21. 1941.—In my revision of the genus *Pittosporum* (Bot. Ser. Field Mus. Nat. Hist. 22: 525. 1942), the capsules of *P. cladanthum* were described as "rugose or rough-tuberculate." It should have been added that they are covered with a reddish-brown tomentum, as shown not only in the type collection but also in a large number of supplementary suites examined.

Pittosporum confertiflorum A. Gray, Bot. United States Explor. Exped. 232, pl. 19. 1854.—This species is commonly described in literature as having cream-colored corollas. The matter of corolla-color should be reinvestigated in the field, for a recent collection has been made in East Maui, in which the collectors describe the flowers as "lemon-yellow (*not* creamy-white):" *William H. Hatheway & Amy Greenwell* 482, diffuse tree, nearly fruticose habit, 15 feet tall, 2 inches diameter at breast height; near upper edge of montane rain-forest, with *Acacia Koa, Metrosideros, Myoporum, Myrsine,* south slope of Haleakala, in gulch between Kahua Crater and Nawini, alt. 6,000 feet, Nov. 24, 1950 (Chicago Nat. Hist. Mus., etc.).

Pittosporum sulcatum var. **Rumicifolium** f. **tomentellum** Sherff, Bot. Ser. Field Mus. Nat. Hist. 22: 510. 1942.—This *forma* was founded on *Degener* 11,005 *proparte* from above Pauoa Flats, Honolulu, southern Oahu. It has been collected recently in extreme northern Oahu: *Degener & Hatheway* 20,725, few-branched tree 10 feet tall, on wind-swept summit one mile south of Black Junction, Pupukea-Kahuku, Sept. 19, 1950 (Chicago Nat. Hist. Mus., etc.). A reexamination of *Degener et al.* 12,074, from the same region and formerly cited by me (*op. cit.* 508) for *P. sulcatum* var. *Remyi.*, shows that that collection is more properly referred here.

Euphorbia Celastroides Hathewayi, var. nov.—Folia principalia eis varietatis *Hillebrandii* circumambitu sed non semper colore valde similia, oblonge elliptico-lanceolata, apice acuta vel subacuta rarius obtusa vel retusa, basi subangusto inaequaliter rotundata, lamina saepius 4-6.5 cm. longa et 1-2.3 cm. lata; petiolo 1.5-3.2 mm. longo; saepe aliis foliis additis, his multo minoribus varie obovatis oblongis ovalibus apice obtuso vel truncato-emarginato. Specimens examined: *William H. Hatheway* 223, a 5-foot tree, 2 inches diameter at base, alt. 1,400 feet, arid wind-swept ridge in weedy scrub, east slope of Keawapilau Gulch,

Mokuleia, northwestern Oahu, Sept. 5, 1950 (type, Chicago Nat. Hist. Mus., my photograph no. 4,070; isotypes, Bishop Mus.; New York Bot. Gard.; etc.); *Hatheway* 228, 4-foot single-stemmed shrub, steep slope in dry-land scrub, same place and date (Chicago Nat. Hist. Mus.; Bishop Mus.; etc.); *Hatheway* 374, tree 12 feet tall, 3 inches diam. at base, alt. 1,300 feet, open dry-land forest, with *Lantana, Ochrosia, Colubrina,* east side of East Makaleha Stream, below Du Pont Trail, northwestern Oahu, Aug. 21, 1950 (Chicago Nat. Hist. Mus.; Bishop Mus.; etc.); *Hatheway & Miss Amy Greenwell* 289, 5-foot shrub, in *Guava*-zone scrub, Waimea Stream flood-plain, northwestern Oahu, July 27, 1950 (Bishop Mus.; Chicago Nat. Hist. Mus.; etc.).

Six other varieties of *Euphorbia Celastroides* are known for the Island of Oahu, although the species proper is absent (*cf.* Sherff, Ann. Missouri Bot. Gard 25:24-40. 1937): Var. *kaenana,* northwesternmost Oahu; var. *halawana* (as to its f. *kahanana*), eastern Oahu; var. *saxicola,* southeastern Oahu; var. *Humbertii,* southern Oahu; var. *niuensis,* southeastern Oahu; and var. *amplectens,* southeastern Oahu. From the var. *kaenana,* var. *Hathewayi* differs in its broader, oblongly elliptic-lanceolate, at apex usually acute or subacute (not oblong-oblanceolate, at apex usually obtuse to truncate-subemarginate) leaves. From the remaining five varieties (none of which are known from northwestern Oahu), var. *Hathewayi* can be told at once by its apically narrowed and commonly acute or subacute, usually longer and broader principal leaves. These suggest those of *E. Hillebrandii.** That species has delicate, green, herbaceous branchlets (as in *E. multiformis*), whereas the present variety has the thickish, reddish, nodose, woody branchlets so characteristic of *E. Celastroides* and its numerous previously described varieties.

Labordia Fagraeoidea multinervia, var. nov.—Varietati *Hillebrandii* et f. *subcalvae* affinis. Folia (sicca intense atrocaerulea) non nisi juvenia etiam sparsim hispidula; lamina plus minusve obovata, apice subabrupte acuminata, de medio usque ad petiolum 5-9 mm. longum subsensim angustata, 5-7 cm. longa et 2-3.4 cm. lata. Inflorescentia 3-5-flora, umbellata, conferta. Sepala exteriora ovata vel etiam subrotunda, 1-1.4 cm. longa, glaberrima, apice abrupte breviterque acuminata, tergo plerumque 7-nervia. Corolla auran-

* Which in some parts of its range (Oahu and northwesternmost Maui) has been suspected of forming hybrids with varieties of *E. Celastroides* (cf. Sherff, Ann Missouri Bot. Gard. 25: 58. 1937).

tiaca; tubo turgido plus minusve 1.2 cm. longo, glabro saltem infra; lobis oblongo-ovatis, intus guttur versus dense setosis, circ. 7-8 mm. longis, siccis atris vel brunneis margine hyalino conspicue flavo excepto. Capsulae non visae. Specimens examined: *William H. Hatheway & Otto Degener* 379, tree 12 feet tall, trunk 2 inches in diameter at breast height, flowers orange-yellow, alt. 1,900 feet, growing with *Metrosideros polymorpha* in montane rain-forest near wind-swept summit ridge, Pupukea-Summit trail, Kuhuku Forest Reserve, Koolau Range, northernmost Oahu, Sept. 19, 1950 (type, Chicago Nat. Hist. Mus., my photograph no. 4,071: isotypes, Bishop Mus., my photograph no. 4,072; New York Bot. Gard., my photograph no. 4,073).

Labordia Fagraeoidea var. *Hillebrandii* Sherff has the outermost sepals narrower, only 5-nerved, and externally hispid (especially so below). Its leaves are sparsely appressed-setose when young but soon become glabrous. This is true also for var. *multinervia*, which, however, has the sepals differing as noted. Var. *Hillebrandii* f. *subcalva* Deg. & Sherff, known from a single collection in the Waianae Range, at a station in southwestern Oahu, makes a slight approach to var. *multinervia* in having its sepals outwardly glabrous or but sparsely setulose toward base.

Phyllostegia racemosa Benth. Bot. Reg. vol. 15, no. 1292 *sub Tribo* 6, Prasieae. 1830; Labiatae 653. 1835.—Former specimens cited by me for this species (Bull. 136 Bernice P. Bishop Mus. 50. 1935) were known definitely only from Mauna Kea, Isl. Hawaii. From the following specimens the range is now seen to extend far southward on the same island to about 19° 18′ N. and 155° 19′ W.: *Hatheway* 432, vine, flowers white, climax forest of enormous trees of *Acacia Koa* and *Cibotium glaucum* about 3 miles north of Kulani and 4 miles southeast of Waiakea Camp, Upper Waiakea Forest Reserve, alt. 5,000 feet, Isl. Hawaii, Oct. 28, 1950 (Chicago Nat. Hist. Mus. etc.); *Forbes* 921-*H*, above Kipuka Ahiu, Isl. Hawaii, June 23, 1915 (herb. Dr. Liberty Hyde Bailey, Ithaca, New York).

Phyllostegia vestita Benth. Bot. Reg. *loc cit.*; Labiatae 651.—Heretofore this species has been reported as having the corolla white or cream-colored. Mr. Hatheway sends me a large suite (his no. 447) from Upper Waiakea Forest Reserve, Isl. Hawaii, in which he found the fresh corollas pink. His labels describe the plant as a "long-creeping vine, resembling common squash.... Fertile branches die after fruiting."

Bidens micrantha rudimentifera, var. nov.— Habitu varietati *micranthae* ipsi valde similis sed differt: involucri bracteis exterioribus plerumque 3-4 mm. longis, achaeniis plerumque non tantum 2-4 aristatis sed rudimento vel rarius 2 rudimentis instructis, his quam aristis dupliciter longioribus clavato-flagelliformibus, plus minusve obcompressis, superne puberulentis. Specimens examined: *William H. Hatheway & Miss Amy Greenwell* 465, forming large colonies, easily recognizable at considerable distance, on the steep headwalls of a small canyon 200 yards west of Kahua crater, south slope of Haleakala, alt. 7,000 feet, East Maui, Nov. 24, 1950 (type, Chicago Nat. Hist. Mus., my photograph no. 4,078: isotype, Bishop Mus.); *Hatheway & Greenwell* 467, erect shrub.... on face of cliff, same locality and date (Chicago Nat. Hist. Mus.).

The anomalous rudiments (in my monographic studies of genera in the Coreopsideae, I do not recall ever having seen such structures before) tend to arise from the very apex of the achene and to stand just at the base of an awn. At times they are adnate to an awn for part of its length. Occasionally the upper part is 1 mm. or so broad, yellow, and plus or minus 3-striate, and they are then seen to be reminiscent of the petals of an ancient, polypetalous corolla. Strangely enough, they stand now inside the awns (*i.e.*, toward the center of the achene's apex), now outside the awns, in this latter case inspiring the suspicion that the subtended awns may not have derived from pristine calyx-lobes (numerous capitula at anthesis have been examined and found to have normal corollas on the disk-florets). It is to be hoped that cultural studies of this interesting shrub may be carried on, to determine if possible whether or not the characters noted are to any extent teratological.

Bidens torta × B. waianensis, a new (putative) hybrid.— *Bidens torta* Sherff (Bot. Gaz. 70: 105. 1920) and *B. waianensis* Sherff (*op. cit.* 104) are common species in northwestern Oahu. In an earlier work (The Genus Bidens, Bot. Ser. Field Mus. Nat. Hist. 16: 134. 1937) I have mentioned hybrids of *B. torta* with *B. fecunda* Sherff and with *B. amplectens* Sherff. Recently there have come to hand two suites of specimens that show various intermediate characters between those of *B. torta* and *B. waianensis* and are undoubtedly hybrids between the two: *Degener et al.* 20,737, upper edge of hanging forest on precipitous, grassy slope at 1,600 feet alt., southeast slope of Makua Valley, opposite Piko Trail, Isl. Oahu, Sept. 17, 1950 (Chicago Nat.

Hist. Mus., etc.); *Degener* 20,811, grassy, rocky knife-edge at 1,900 feet alt., east spur of East Ridge of West Branch of East Makaleha Valley, Isl. Oahu, Sept. 30, 1950 (Chicago Nat. Hist. Mus., etc.).

Bidens Rubifolia Cuatrecasasii var. nov. Folia nunc simplicia lamina plerumque subrotundato-ovata basi plus minusve truncata apice obtusa plus minusve 3.5-6.5 cm. longa et plus minusve 3.5 cm. lata petiolo 2-4 cm. longo; nunc tripartita foliolis folio simplici similibus sed saepe paulum angustioribus et basi cuneatis, tenuiter petiolulatis, lateralibus interdum rursus 2- vel 3-partitis.—Specimens examined: *José Cuatrecasas* 20,982, alt. 3,080 meters, Quebrada de la Chorrera Barragán, valley of the Rio Bugalagrande, western slope of the Cordillera Central, Dept. del Valle, Colombia, Apr. 22, 1946 (Chicago Nat. Hist. Mus., two type sheets, my photograph no. 4,079 and no. 4,080).

Rarely a specimen of *B. Rubifolia* H.B.K. proper has been seen heretofore with one or at most a few leaflets broad and apically blunt (*I. F. Holton* 265, *Bogotá*, Colombia, Oct. 28, 1852, in Herb. New York Bot. Gard., my photograph no. 298, being such a case). The present material, of which I have seen four specimens very kindly lent me by Dr. Cuatrecasas, are remarkably uniform in the broad, blunt leaves and leaflets and seem well worth distinguishing varietally.

Bidens sandvicensis antrorsa Degener & Sherff, var. nov. —Varietati *typicae* (*i.e.*, var. *sandvicensi*) similis sed achaeniis nunc exaristatis nunc biaristatis aristis antrorsum 1-pauco-barbatis corpore paulo erecto-setosiore differens.—Specimens examined: *Degener & Hatheway* 21,183, 3-6 feet tall, open forest, alt. 2,000 feet, central ridge at head of Wailupe Valley, Isl. Oahu, Dec. 19, 1950 (type, Chicago Nat. Hist. Mus.: many isotypes to be distributed).

In the sections Meduseae, Platycarpaea, and Psilocarpaea, various species with achenial aristae normally retrorsely barbed are known to have a variety with the aristae antrorsely barbed. Such a variation is highly anomalous, however, in the section Campylotheca to which the present species belongs.

BOTANICAL LEAFLETS

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I. A revision of the Hawaiian Island genus Nototrichium Hillebr. (fam. Amaranthaceae).

By Earl Edward Sherff

In the present revisional treatment, the names of all depositories cited for "specimens examined" are abbreviated as follows: Berl., Berlin Botanical Garden; Bish., Bernice P. Bishop Museum, Honolulu: Chi., Chicago Natural History Museum; Corn., Cornell University, Ithaca; Del., Delessert Herbarium, Geneva; Gray, Gray Herbarium of Harvard University, Cambridge; Kew, Royal Botanic Gardens, Kew; Mo., Missouri Botanical Garden, St. Louis; N.Y., New York Botanical Garden; Par., Museum of Natural History, Paris; U.S., United States National Museum, Washington, D. C. Photographs cited are in the Herbarium of the Chicago Natural History Museum and a duplicate set is in the author's possession.

Genus **Nototrichium** Hillebr.: Description

Ptilotus sect. *Nototrichium* A. Gray *ex* Hillebr. Fl. Haw. Isls. 372. 1888.

Nototrichium pro genere Hillebr. *loc. cit.*

Dichotomously branched shrubs or trees. Leaves opposite, pinnately nerved. Flowers hermaphrodite, small, sessile, in terminal and axillary spikes with a woolly or pubescent rhachis, tribracteate (bracts short, awnless, the lowest for each flower persistent), conical, hispid-villous or pubescent, apetalous. Calyx deeply 4-parted, lobes equal, an outer pair enclosing an inner one. Stamens 4, slightly connected at base; anthers 2-celled, affixed near apex, cells basally divergent. Staminodia absent. Ovary 1-celled and 1-ovuled; ovule erect, anatropus; style slender; stigma capitate. Fruit an oblong or obovoid, thin utricle, this enclosed in the calyx and breaking transversely in age. Seed lenticular, with thin testa; embryo spiral, around mealy albumen; cotyledons broader and longer than the superior radicle.

CONSPECTUS OF SPECIES AND VARIETIES

I. *Nototrichium sandwicense* (Hawaii) 4
var. β. *pulchellum* (western Molokai) 8
var. γ. *pulchelloides* (western Molokai) 8
var. δ. *longespicatum* (Molokai and perhaps West Maui) 9
var. ε. *Forbesii* (western Molokai) 9
var. ζ. *subcordatum* (Molokai, Maui, and Hawaii) . 10
var. η. *Syringifolium* ("Hawaiian Isls.") 10
var. θ. *dubium* (East Maui) 11
var. ι. *latifolium* (Lanai) 12
var. κ. *olokeleanum* (Kauai) 12
var. λ. *macrophyllum* (southeastern Hawaii) 12
var. μ. *kolekolense* (southeastern Molokai) 13
var. ν. *mauiense* (West Maui) 14
var. ξ. *Helleri* (west-central Kauai) 14
var. ο. *lanceolatum* (northwestern Hawaii) 15
var. π. *leptopodum* (northwestern East Maui).... 15
var. ρ. *lanaiense* (northern Lanai and East Maui) . 15
var. ς. *kauaiense* (western Kauai) 16
var. τ. *decipiens* (western Kauai) 17
2. *Nototrichium viride* (southern Kauai) 17
var. β. *subtruncatum* (northwesternmost Oahu).. 18
var. γ. *oblongifolium* (Kauai) 19
3. *Nototrichium humile* (northwestern Oahu) 19
var. β. *subrhomboideum* (northwestern Oahu) ... 20
var. γ. *parvifolium* (northwestern Oahu) 21

KEY

Spikes stout, cylindrical to ovoid, 5 mm. or more thick, hispid-villous.

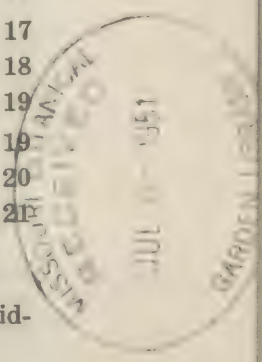
Leaves silky on both faces; stamens and style about or nearly as long as calyx..1. *N. sandwicense* and vars.

Leaves glabrate above unless near larger nerves; stamens and style mostly half as long as calyx.

2. *N. viride* and vars.

Spikes slender, finally about 4 mm. thick.

3. *N. humile* and vars.



1. **Nototrichium sandwicense** (A. Gray) Hillebr. Fl. Haw. Isls. 373. 1888; *Ptilotus sandwicensis* A. Gray and var. *a* A. Gray *ex* H. Mann, Enum. Haw. Pl. 200. 1867; *Psilotum sandwichense* A. Gray *in* Mann *ex* Seem. Fl. Vit. 198. 1865-1873; *Psilotrichum sandwicense* Seem. *ex* Drake del Cast. Ill. Fl. Ins. Mar. Pacif. 270. 1886; *Nototrichium sandwicense* var. *typicum* Sherff, Bot. Leaflets 1: 2. 1950.

a. Leaves widely cuneate or very subtruncate to subcordate at base.

b. Leaf-blades mostly 1.5-3 cm. long and 1-2 cm. wide. var. δ. *subcordatum*.

b. Leaf-blades ±7.5 cm. long and ±4.8 cm. wide, at apex sharply acuminate; petioles slender, pedicels capilliform, spikes silvery-grayish, calyces easily visible and narrowly cylindric ..... var. η. *Syringifolium*.

b. Leaf-blades up to 5.5 cm. long and to 3.7 cm. wide, at apex moderately acuminate; -petioles flat and margined; pedicels somewhat thickish, spikes stramineous, calices almost concealed by the hairs and considerably stouter. var. θ. *dubium*.

a. Leaves narrower at base.

b. Leaves prevailingly elliptic to lanceolate.

c. Leaf-blades drying light-green or cinereous, often subrhomboidal, on petioles mostly under 3 mm. long; plant native to west-central Kauai ..... var. ξ. *Helleri*.

c. Leaf-blades drying dark-green above, not or inconspicuously subrhomboidal, on petioles more slender and 5-10 mm. long; plant native to northwestern Hawaii ..... var. ο. *lanceolatum*.

b. Leaves broader.

c. Spikes mostly 2.5-5 cm. long; plants from Molokai and, at least formerly, West Maui.

d. Leaf-blades commonly 2-3.5 cm. long and 1.2-2.2 cm. wide, basally cuneate, very silvery or yellowish-silvery beneath ..... var. ε. *Forbesii*.

d. Leaf-blades up to 6 cm. long and 4.2 cm. wide, basally broad-cuneate to subrotund, more or less greenish beneath ..... var. δ. *longespicatum*.

c. Spikes mostly shorter.

d. Leaves of flowering branches large, blades often 5-11 cm. long and often 3.5-5.5 cm. wide; plants from Lanai and southeastern Hawaii.

e. Leaf-blades broadly ovate, at apex moderately or subabruptly acuminate; plant native to Lanai .....var. ι. *latifolium.*

e. Leaf-blades narrowly to moderately ovate or ovate-oblong, at apex acute or acuminate.

var. λ. *macrophyllum.*

d. Leaves of flowering branches smaller.

e. Leaf-blades mostly obovate; plants from western Kauai and East Maui.

f. Leaf-blades mostly 1-3 cm. long and 7-17 mm. wide .....var. τ. *decipiens.*

f. Leaf-blades mostly 3-7 cm. long and 1.4-4 cm. wide.

g. Leaf-petioles manifestly margined; plants from western Kauai.....var. ς. *kauaiense.*

g. Leaf-petioles slender and but slightly margined; plants from Lanai and East Maui.

var. ρ. *lanaiense.*

e. Leaf-blades mostly otherwise.

f. Leaf-petioles very slender, often 2-3 cm. long; leaf-blades mostly rounded or obtuse at apex; plant from East Maui....var. ϒ. *leptopodum.*

f. Leaf-petioles slender or somewhat margined, mostly under 15 mm. long.

g. Leaf-blades mostly 3-7 cm. long and 1.4-4 cm. wide.

h. Leaf-blades mostly obtuse to subacute at apex; plant native of northern Lanai and East Maui.....var. ρ. *lanaiense.*

h. Leaf-blades mostly narrower at apex.

i. Peduncles subrobust, elongate, mostly 5-7.5 cm. long; plant native to central Kauai .....var. κ. *olokeleanum.*

i. Peduncles delicate, mostly under 3 cm. long; plants native to Isl. Hawaii.

N. sandwicense sensu stricto.

g. Leaf-blades smaller.

h. Leaves mostly obtuse or rounded at apex; plant native of southeastern Molokai .....var. μ. *kolekolense.*

h. Leaves mostly acute to scarcely acuminate at apex.

i. Leaves similarly colored and densely tomentulose on both faces, nerves thickish and salient beneath; plant native of West Maui.

var. *ν. mauiense.*

i. Leaves appressed-setose and (at least when dried) much darker above; nerves neither thickish nor salient beneath; plant native to western Molokai .....var. β. *pulchellum.*

Shrubby or at higher altitudes arborescent and 5-6 m. tall, the young branchlets angular, articulated, and silky-canescent to yellowish-tomentulose. Leaves petiolate, petiole slender, pubescent, 6-18 mm. long; blade ovate to ovate-lanceolate or ovate-oblong, mostly cuneate at base and acuminate or attenuate at tip, entire, appressed-silky above, silvery- or yellowish-tomentose and paler beneath, 3-6.5 cm. long and 2-4 cm. wide. Spikes usually 3 or 5 at end of a branchlet, thick-ovoid to cylindrical, 1-3 (or finally sometimes 4) cm. long, peduncle 0.6-3 cm. long, rhachis densely villous. Flowers crowded, ovoid, 2-3 mm. long, villous with spreading hairs. Bracts half as long or longer, ovate and thin-conchoidal below, subulate-attenuate above. Sepals ovate to lanceolate, 3-5 nerved, somewhat acute, not mucronate, hispid on back, marginally scarious and glabrous. Stamens nearly equalling perianth, filaments subulate from a broader base. Pistil equalling calyx; ovary oblong, truncate; style with punctiform stigma.

Type: *Jules Remy* 207, Isl. Hawaii, 1851-1855 (Gray).

Distribution: Known only from Island of Hawaii, Hawaiian Islands.

Specimens examined (all from Isl. Hawaii): *Annie M. Alexander & Louise Kellogg* 5,369, North Kona, May 28, 1948 (Bish.); *C. J. Austin,* Puuwaawaa, 1912 (Bish.); *Otto Degener* 9,870, in *aa* lava *kipuka* in arid region, between Honuapo

and Hilea, Feb. 17, 1930 (Del.; N.Y.); *Degener* 9,872, tree-covered dry *aa* lava *kipuka*, half-way between Kaalualu and Waiohinu, Sept. 7, 1929 (N.Y., 2 sheets); *Degener, Iwasaki, & Pohina* 3,902, in canyons in arid region, 4 miles along road from Waimea toward Kohala, Mar. 25, 1930 (Mo.; N.Y.); *Degener & Wiebke* 3,338, arid lava, at 1907 lava flow near Kona-Kau Boundary, Jul. 25, 1926 (N.Y.); *C. N. Forbes* 57-*H* large bushes, very common, Puuwaawaa, June 8-14, 1911 (Bish.); *Forbes* 371-*H*, Kapua, Kona, Jul. 26, 1911 (Bish.; Mo.; N.Y., U.S.); *Forbes* 436-*H*, Kau Desert, August, 1911 (Bish.; Mo., 2 sheets; N.Y.); *F. R. Fosberg* 10,139, tree 4 m. tall, on old lava, alt. 600 m., Kona Road between lava flows of 1887 and 1907, Aug. 31, 1933 (Chi.); *Fosberg* 10,169, bush 3 m. tall, on old lava, Kona-Kohala Road near 1859 lava flow, Sept. 1, 1933 (Chi.); *Fosberg* 10,172, bush 2 m. tall, dry, open forest, alt. 1,015 m., Waimea-Kohala Road, slopes, Kohala Mts., Sept. 2, 1933 (Chi.); *Mrs. V. O. Fosberg* 41, dry lava flow, flow of 1859, North Kona, Aug. 8, 1936 (Chi.); *William Hillebrand* 156, Kawaihae iuka (Kew); *Albert S. Hitchcock* 14,322, small tree in ravine, alt. 2,700-4,000 feet, Waimea, Aug. 25, 1916 (U.S.); *Hitchcock* 15,591, Waimea, same date (U.S.); *L. H. MacDaniels* 266, scraggly tree 4 m. tall, rough lava, very dry, alt. 500 m., Kapua, Nov. 16, 1926 (Bish.); *A. Meebold*, Huehue, alt. 3,000 feet, May, 1932 (Bish.); *Jules Remy* 207 (type, Gray, my photograph no. 4,048: isotype, N.Y.); *J. F. Rock* 3,808, Hilea, Kau, April, 1911 (Gray); *Rock* 3,814, Puuwaawaa, June 14, 1909 (Bish.); *Rock & Giffard*, Kau, April, 1911 (Bish.; N.Y.); *Carl Skottsberg* 610, along road through Kau, near boundary to South Kona, Sept. 21, 1922 (Bish.); *United States South Pacific Explor. Exped.*, 1838-1842 (Gray; U.S.).

H. Mann *(loc. cit.)* published for this species its first description, which he quoted directly from Asa Gray's manuscript (Bot. S. Pacif. Expl. Exp. *ined.*). He cited for it two specimens, *Mann & Brigham* 590 and *Remy* 207. The first of these was a very different species from that known to Gray, and later was very properly made the type of a new species, *N. viride* Hillebr. Fl. Haw. Isls. 373. 1888. The second, namely *Remy* 207, Isl. Hawaii, was one of two collections before Gray when he drew up his manuscript description. Gray had before him also the material collected by the United States South Pacific Exploring Expedition on Hawaii. At the Gray Herbarium, specimens of both collections are mounted on the

same sheet and both are labeled in Gray's hand, "*Ptilotus (Nototrichium) Sandwicensis.*" They are specifically identical but varietally different. The Remy material has its leaves more in accord with Gray's description for his *alpha* var. ("foliis ovatis nunc ovato-lanceolatis plerisque acuminatis, rarius ovali-oblongis obtusis basi pl. m. attenuatis") and hence is to be taken as the type of var. *typicum*.[1] The U.S.S. Pacif. Explor. Exped. specimens just cited are referable to *N. sandwicense* var. *subcordatum (qu. vide)*. It may be noted, however, that an additional specimen, collected by the same expedition and sent to Hooker with Gray's determination, *Psilotus (Nototrichium) sandwicensis* n. sp., is at Kew and matches *Remy* 207 in foliage.

Nototrichium sandwicense var. β. **pulchellum** Sherff, Bot. Leaflets 2: 3. 1950.

Leaves rather small and apically acute or barely acuminate, blade only 1.5-3 (rarely -4) cm. long and 1-2.5 cm. wide, thinnish, most abundantly and minutely glandular-punctulate and subsparsely appressed-setulose on the noticeably darker upper surface. Spikes 1-2 cm. long.

Type: *Joseph F. Rock*, Mahana, western Molokai, February, 1910 (Gray).

Distribution: Known only from type locality on Island of Molokai.

Specimens examined: *Rock*, Mahana, Isl. Molokai, February, 1910 (type, Gray, my photograph no. 4,058: isotypes, Bish.; N.Y.).

Nototrichium sandwicense var. γ. **pulchelloides** Deg. & Sherff *ex* Sherff, Bot. Leaflets 3: 2. 1951.

Similar to var. *pulchellum* but with thinner leaves; blade of the larger ones basally rounded or subtruncate, their principal nerves brown-stramineous and often imperfectly glabrate.

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[1] In discussing *Nototrichium sandwicense*, A. A. Heller (Minnesota Bot. Studs. 1:821. 1897), quoted the original localities as "Hawaii, near the coast; Oahu." Here he was relying, however, not upon Gray's manuscript as quoted by Mann, but upon Mann's own addition to the text quoted from Gray. A few lines earlier, Heller stated that the type was *Remy* 207, but added: "Under this number are two forms, one from Hawaii, with acuminate leaves on slender marginless petioles, the other from Oahu, with bluntish leaves, on margined petioles." I have seen no material of *Remy* 207 except from the Island of Hawaii.

Type: *Otto Degener* 9,869, only a few plants seen, in last relic of arid forest, on cliff, near Waiahewahewa Gulch, West Molokai, Apr. 18, 1928 (N.Y.; my photograph no. 4,077).

Nototrichium sandwicense var. δ. **longespicatum** Hillebr. Fl. Haw. Isls. 373. 1888; *Psilotrichum sandvicense* var. *longespicatum* Hillebr. *ex* Drake del Cast. Ill. Fl. Ins. Mar. Pacif. 270. 1886.

Leaves larger, blade of principal ones 4-6 cm. long and 2.5-4.2 cm. wide, thinnish, ovate or sometimes subrhomboidal, at base broadly cuneate to subrotund, at apex obtusish, more or less greenish underneath. Spikes elongate-cylindric, 2.5-5 cm. long.

Type: *William Hillebrand,* West Maui (formerly at Berlin, but destroyed by war).

Distribution: Attributed by Hillebrand (1) to West Maui and (2) to Kalaupapa, on northern coast of Molokai. Known at present only from widely separated localities in western, central-northern, and southeastern Molokai.

Specimens examined (all from Isl. Molokai) : *Otto Degener* 9,868, occasional on arid cliff, dry region, second eastern gulch, Wawaia, June 27, 1928 (Corn.; Mo.; N.Y., 2 sheets); *C. N. Forbes* 43-*Mo,* Settlement Trail, June, 1912 (N.Y.; U.S.); *Joseph F. Rock,* Mauna Loa, February, 1910 (N.Y.; U.S.); *Rock,* Mahana, Mauna Loa, same date (Bish.); *Rock* 1,509, same place and date (Gray).

The specimens collected by Rock are identical with the plate published by him (Indig. Trees Haw. Isls. pl. 49. 1913) for *Nototrichium sandwicense.* Some or all of them doubtless came from the tree shown in his habit-illustration (*loc. cit.* pl. 50) for *N. sandwicense,* although his legend, as to "elevation 2000 feet" is grossly inexact, Mauna Loa's highest point being only 1,382 feet above sea-level.

Nototrichium sandwicense var. ε. **Forbesii** Sherff, Bot. Leaflets 2: 2. 1950.

Leaves numerous, small, the slender or scarcely submargined petiole 5-8 mm. long; blade rhomboidal-ovate or rarely rhomboidal-subobovate, at base cuneate, at apex obtuse or more rarely acute, commonly 2-3.5 cm. long and 1.2-2.2 cm. wide, strongly silvery or yellowish-silvery beneath. Spikes elongate-cylindric, 2-4.5 cm. long.

Type: *Charles N. Forbes* 3-*Mo*, Mauna Loa, western Molokai, June, 1912 (N.Y.).

Distribution: Western end of Molokai.

Specimens examined (all from Molokai): *Forbes* 3-*Mo* (type, N.Y., my photograph no. 4,050: isotypes, Bish.; Mo., my photograph no. 3,949; U.S.); *George C. Munro*, Papohaku, 1920 (Bish.).

Nototrichium sandwicense var. ζ. **subcordatum** Deg. & Sherff *ex* Sherff, Bot. Leaflets 1: 3. 1950.

Leaves very small, crowded at tips of branchlets, petiole 4-8 mm. long and usually submarginate; blade ovate-subcordate, at base very broadly cuneate to truncate or subcordate, at apex acute or more or less acuminate, only 1.5-3 (rarely -4.2) cm. long and 1-2 (rarely -2.7) cm. wide. Spikes 1-2 cm. long.

Type: *Otto Degener* 9,873, about 17 miles from Kohala toward Waimea, Isl. Hawaii, Aug. 13, 1926 (N.Y.).

Distribution: Southeastern Molokai, Maui, and North Kohala District of Hawaii.

Specimens examined: Isl. Maui.—*William Hillebrand* 155 (Gray; Kew).

Isl. Molokai.—*Otto Degener* 9,871, one of the dry valleys between Kamalo and Kaunakakai, July 29, 1928 (Chi., my photograph no. 3,941; Mo.; N.Y.; U.S.).

Isl. Hawaii.—*Otto Degener* 9,873 (type, N.Y., my photograph no. 4,036); *William Hillebrand*, Kawaihae iuka (*ex* Berl. *in* Bish.); *Albert S. Hitchcock* 14,322, small tree in ravine, alt. 2,700-4,000 feet, Waimea, Aug. 25, 1916 (U.S., atypic as to somewhat larger leaves, the blades up to 4.2 cm. long and to 2.7 cm. wide); *United States South Pacific Exploring Expedition*, Isl. Hawaii, 1838-1842 (Gray; U.S.; labeled and listed by Gray in his manuscript for his *Ptilotus sandwicensis*, as remarked above for the species proper, *i.e.*, var. δ. *typicum*).

Nototrichium sandwicense var. η. **Syringifolium** Sherff, Bot. Leaflets 1: 2. 1950.

Leaves (of the single branchlet examined) slenderly petiolate, petiole scarcely margined, ±1.5 cm. long; blade very thin, broadly ovate, dark and to naked eye *seemingly* glabrate (in reality appressedly hispidulous) above, grayish-tomentulose

beneath, at base widely truncate or subcordate, at apex sharply acuminate, ±7.5 cm. long and ±4.8 cm. wide. Spikes short-ovoid, up to ±1 cm. long, peduncles capilliform and mostly about 2 cm. long; calyx about 3 mm. long and 1.2 mm. thick, the upper part frequently much less hairy and hence visible separately in the spike.

Type: *William Hillebrand,* Hawaiian Isls. (Kew).

Distribution: Of unknown extent in the Hawaiian Islands.

Specimens examined: *Hillebrand,* Hawaiian Isls. (type, Kew, my photograph no. 4,039).

Differs from var. *θ. dubium* in its narrower leaf-petioles, its definitely larger leaf-blades (these more nearly subcordate at base and more sharply acuminate at apex), its pedicels more slender, its spikes silvery-grayish instead of stramineous, its calyces more easily visible and more slender (about 3.5 mm. long and 1.25 mm. thick), etc.

Nototrichium sandwicense var. *θ.* **dubium** Sherff, Bot. Leaflets 2: 2. 1950.

Leaves cordate-ovate, the flattened and margined petiole up to 12 mm. long; blade under 5.5 cm. long and 3.7 cm. wide, at apex moderately acuminate, at base rounded or subtruncate (perhaps at times barely subcordate). Spikes stramineous, under 1.2 cm. long; flowers fewer, thicker, and more hispid.

Type: *Charles N. Forbes* 1,816-*M,* shrub, only one seen, densely branched, 3 feet tall . . . leaves silvery-pubescent below, light-green with a suggestion of yellow above, branches somewhat silvery-gray, on side of a gulch, south slope of Haleakala, southeastern East Maui, Mar. 3, 1920 (Bish.).

Distribution: Known only from type locality in southeastern East Maui.

Specimens examined: *Forbes* 1,816-*M* (type, Bish., my photograph no. 4,059).

The fewer- and coarser-flowered spikes might at first suggest a separate specific rank for the type plant,[2] but such spikes are fairly well matched in occasional collections of var. *typicum* (*e.g., Forbes* 371-*H* from Isl. Hawaii).

[2]On the type sheet had been written in pencil, doubtless by Forbes, "var. or sp. nov."

Nototrichium sandwicense var. ι. **latifolium** Sherff, Bot. Leaflets 1: 3. 1950.

More often silvery-pubescent. Leaves slenderly petioled, petiole under 2 cm. long; blade thin, broadly ovate, at base very broadly cuneate, at apex moderately or subabruptly acuminate, more often 5-7 cm. long and 3.5-4.8 cm. wide. Spikes more often 2-3.3 cm. long.

Type: *Rock & Hammond* 8,117, Maunalei Gorge, Isl. Lanai, July 30, 1910 (Gray).

Distribution: Island of Lanai.

Specimens examined: *George C. Munro* 192, Malaea, Isl. Lanai, Nov. 3, 1913 (N.Y.); *Rock & Hammond* 8,117 (type, Gray, my photograph no. 4,041: isotypes, Bish., my photograph no. 4,043; N.Y.).

Nototrichium sandwicense var. κ. **olokeleanum** Sherff, Bot. Leaflets 2: 3. 1950.

Leaves with margined petiole, this 4-8 mm. long; blade subrhomboidally or oblongly ovate, on both faces tomentulose, whitish-cinereous and salient-veined beneath, darker above, basally cuneate, gradually narrowed toward the subacute or acuminate apex, commonly 3-6.5 cm. long and 1.3-3 cm. wide. Peduncles somewhat stouter, more or less fastigiately disposed, more elongate (often up to 7.5 cm. long). Spikes 1-3 cm. long.

Type: *Joseph F. Rock* 5,422, Olokele Canyon, Isl. Kauai, Haw. Isls., September, 1909 (Gray).

Distribution: Known only from type locality in central Kauai.

Specimens examined: *John M. Lydgate,* Olokele Valley, Kauai (Bish., form with smaller leaves, the blade up to 2.5 cm. long and to 1.5 cm. wide); *Rock,* Kauai, October, 1916 (Bish.); *Rock* 5,422 (type, Gray, my photograph no. 4,064: isotype, Bish., my photograph no. 4,065); *Rock* 10,060 (5,427), on rocks, alt. 1,500 feet, Olokele Canyon, September, 1909 (topotype, Bish.).

Nototrichium sandwicense var. λ. **macrophyllum** Sherff, Bot. Leaflets 1: 2. 1950.

Principal leaves commonly and leaves of sterile shoots probably always large, the slender petiole submarginate and

1-3 cm. long; blade thin, narrowly to moderately ovate or ovate-oblong, at base rounded or widely cuneate, at apex acute or acuminate, often 8-11 cm. long and ±5.5 cm. wide. Spikes 1-2.7 cm. long.

Type: *G. W. Russ,* shrub 15 feet tall, stem 2 inches thick breast-high, hot dry old *aa* flow, alt. 125 feet, between Hilea and Honuapo, Goat Road, Kau, Isl. Hawaii, June 3, 1927 (Bish.).

Distribution: Known only from type locality near southeastern coast of Hawaii.

Specimens examined (all from Isl. Hawaii) : *Otto Degener* 9,870, in *aa* lava *kipuka* ["an open and fertile place in a forest or a lava flow"] in arid region, between Honuapo and Hilea, Feb. 17, 1930 (Chi., my photograph no. 3,939; Corn.; Mo.; U.S.) ; *G. W. Russ,* same locality, Goat Road, June 3, 1927 (type, Bish., my photograph no. 4,038).

The type sheet bears a cluster of large leaves, apparently all from a sterile shoot, one fruiting specimen with leaf-blades up to 7 cm. long and to 3.2 cm. wide, and two small fruiting specimens not different from those of var. *typicum.* These last two might well have come from a different plant, and so were not included in the type basis of this variety. The excellent supplementary suite of material collected by Degener in the same locality showed the principal leaves on flowering or fruiting branches to be consistently much larger than in var. *typicum* and was used in part for constructing the original, type description.

Nototrichium sandwicense var. μ. **kolekolense** Sherff, Bot. Leaflets 1: 3. 1950.

Leaves petiolate with a slender or submarginate petiole, this 5-12 mm. long; blade small, variously oval ovate obovate or subrotundate-ovate, at base cuneate, at apex obtuse or rounded, commonly 2-2.5 cm. long and 1.4-1.8 cm wide. Spikes about 1-1.5 cm. long.

Type: *Charles N. Forbes* 179-*Mo,* small tree 8 feet tall, on slopes of Puu Kolekole, Isl. Molokai, July 11, 1912 (Chi.).

Distribution: Known only from type locality in southeastern Molokai.

Specimens examined: *Forbes* 179-*Mo* (type, Chi., my photograph no. 3,942: isotypes, Bish.; Mo.; N.Y.).

Nototrichium sandwicense var. *v.* **mauiense** Deg. & Sherff *ex* Sherff, Bot. Leaflets 2: 3. 1950.

Branchlets and leaves densely yellowish-tomentulose, the slenderish petioles 3-7 mm. long; blades ovate, those of principal leaves up to 3.5 cm. long and to 2 cm. wide, at base broadly cuneate or rounded, at apex acute or subacuminate, veins salient and thickish on lower surface.

Type: *Otto Degener & Henry Wiebke* 3,341, arid region near cliff, from Papawai Point toward Puu Anu through Manawainui Gulch, West Maui, July 12, 1927 (N.Y.).

Distribution: Southeasternmost West Maui.

Specimens examined: *Degener & Wiebke* 3,341 (type, N.Y., my photograph no. 4,061).

Nototrichium sandwicense var. ξ. **Helleri** Sherff, Bot. Leaflets 1: 3. 1950.

Leaves numerous, with silvery-ashen pubescence, shortly (2-3 mm.) petiolate or subsessile; blade elliptic-lanceolate or at times subrhomboidally so to somewhat oblong, cuneately narrowed at both ends or just at apex, rarely subacuminate, 3-4.5 cm. long and commonly 1-1.3 cm. wide. Spikes ±1 cm. long.

Type: *Amos Arthur Heller* 2,831 *pro parte*, on banks of a stream in a canyon, alt. about 2,000 feet, on ridge leading up to Kaholuamanu, between forks of the Waimea River, Isl. Kauai, Hawaiian Islands, Sept. 24, 1895 (Chi.).

Distribution: West-central Kauai.

Specimens examined: *Heller* 2,831 *pro parte* (type, Chi., my photograph no. 3,940: isotypes, Gray, my photograph no. 4,035; Kew); *Carl Skottsberg* 1,055, common in middle and inner part of Olokele Canyon, Isl. Kauai, Oct. 31, 1922 (Bish.); *St. John & Fosberg* 13,850, low bush 2-3 feet tall, in patches, dry, steep slope, alt. 3,500 feet, Kumuwela Ridge, Waimea, Isl. Kauai, Dec. 28, 1933 (Chi.).

Heller's collection number 2,831 was used by him also for a suite of specimens belonging to var. *decipiens* (for his discussion of the two suites merged by him under his no. 2,831, see Minnesota Bot. Studs. 1: 821. 1897).

Nototrichium sandwicense var. ο. **lanceolatum** Sherff, Bot. Leaflets 1: 3. 1950.

Aspect open and loose, leaves small, the slender petiole about 5-10 mm. long; blade more often lanceolate, membranaceous, at both ends attenuate, at apex acute or acuminate, 2.5-3.5 cm. long and more often 0.7-1.4 cm. wide. Spikes 1-3 cm. long.

Type: *Joseph F. Rock* 12,973, Puuwaawaa, North Kona, Isl. Hawaii, August, 1917 (Bish.).

Distribution: Known only from type locality in northwestern Hawaii.

Specimens examined: *Otto Degener & Henry Wiebke* 3,340, in arid, lava-covered region, 19 miles from Waimea toward Kona, Isl. Hawaii, Aug. 18, 1926 (Mo., my photograph no. 3,947; N.Y.); *Rock* 12,973 (type, Bish., my photograph no. 4,037).

Nototrichium sandwicense var. ρ. **leptopodum** Deg. & Sherff *ex* Sherff, Bot. Leaflets 1: 2. 1950.

Leaves very delicately petiolate, petiole usually 1.5-3 cm. long; blade highly membranaceous, now broadly ovate or oblong-ovate now broadly obovate to subrotund, at apex rounded or obtuse to barely subacuminate, up to about 3-5 cm. long and about 2-4 cm. wide. Spikes small, ±1 cm. long.

Type: *Otto Degener* 19,341, a 5-foot twiggy shrub, on *aa* lava waste, Nakaohu, Isl. Maui, Dec. 23, 1948 (Chi.).

Distribution: Known only from type locality in southwestern East Maui.

Specimens examined: *Degener* 19,341 (type, Chi., my photograph no. 4,042: isotypes, Bish.; Chi.; Del.; Gray; Kew; Mo.; N.Y.; Par.; U.S.; etc.).

Nototrichium sandwicense var. ρ. **lanaiense** Sherff, Bot. Leaflets 1: 3. 1950.

Leaves very velvety, the slender petiole 5-15 mm. long; blade now rounded-ovate now ovate or obovate, at base broadly cuneate, at apex obtuse or subacute, more often 3-7 cm. long and 2.5-4 cm. wide (on sterile branchlets even to 11 cm. long and to 6 cm. wide). Spikes 1.5-3.3 cm. long.

Type: *Charles N. Forbes* 155-*L*, tree 9 feet tall, densely bushy at top, in dry forests, west end of Lanai, June, 1913 (Bish.).

Distribution: Across northern part of Lanai and in southwestern East Maui.

Specimens examined: Lanai.—*Forbes* 155-*L* (type, Bish., my photograph no. 4,040: isotypes, Mo.; N.Y.; U.S.); *Forbes* 504-*L*, Isl. Lanai, September, 1917 (Bish.); *George C. Munro*, Paomai, Apr. 18, 1914 (U.S.); *Munro* 34, dry forest, same locality, August, 1913 (Bish.); *Munro* 71, same locality, Nov. 18, 1914 (Bish.); *Munro* 108, Mahana, near Maunalei Road, Sept. 22, 1913 (Bish.).

East Maui.—*C. N. Forbes* 2,081-*M*, south slope of Haleakala, Mar. 23, 1920 (Bish.; N.Y.; U.S.); *Gerrit P. Wilder*, Ulupalakua, 1913 (Bish.).

Nototrichium sandwicense var. s. **kauaiense** (A. Gray) Hillebr. Fl. Haw. Isls. 373. 1888; *Ptilotus (Nototrichium) sandwicensis* var. *kauaiensis* A. Gray *ex* H. Mann, Enum. Haw. Pl. 200. 1867; *Psilotrichum sandvicense* var. *kauaiense* A. Gray *ex* Drake del Cast. Ill. Fl. Ins. Mar. Pacif. 270. 1886.

Shrub ±1.5 m. tall, branchlets sometimes subherbaceous. Leaves more or less yellowish-tomentose especially underneath, petiole margined and 2-10 mm. long; blade highly variable in size and salience of veins, obovate, at apex obtuse or rounded, below middle subcuneately narrowed to petiole, 3-5 cm. long and 1.4-3.1 cm. wide on type but varying elsewhere to somewhat smaller or somewhat larger. Spikes elongate-ovoid, 1-1.7 cm. long, peduncles up to 4.5 cm. long.

Type: *United States South Pacific Exploring Expedition*, Isl. Kauai, 1828-1842 (U.S.).

Distribution: Western (especially northwestern) Kauai.

Specimens examined (all from Isl. Kauai): *E. H. Bryan, Jr.*, 628, erect, shrubby tree ±3 m. tall, talus slope between caves and road, alt. 15-20 m., Haena, Aug. 6, 1928 (Bish.; N.Y.); *Otto Degener & Henry Wiebke* 3,337, arid rocky locality near stream-bed, Kaulaula Valley, June 13, 1926 (Mo.; N.Y.; U.S.); *Charles N. Forbes* (with *C. Dole*) 49-*K*, common along trail and to nearly sea-level, Kalalau Valley, July 17, 1909 (Bish.; Mo.; N.Y.); *Forbes* 872-*K*, Kokee region, Waimea Drainage Basin, west side, July 3-Aug. 18, 1917 (Bish.); *Forbes* 1,075-*K*, bushy, 5 feet tall, Halemanu cliff trail to above teachers' camp, July 3-Aug. 18, 1917 (Bish.); *Joseph F. Rock* 1,707, Halemanu, Feb. 14-26, 1909 (Bish.); *Rock* 2,173, Kopiwai, Halemanu, Feb. 14-26, 1909 (Bish.; Gray);

United States South Pacific Exploring Expedition, Isl. Kauai, 1838-1842 (type, U.S., my photograph no. 4,049: istoypes, Gray; Kew).

Nototrichium sandwicense var. τ. **decipiens** Sherff, Bot. Leaflets 2: 2. 1950.

Leaves shortly petiolate (petioles slender to marginate and but 1-4 mm. long; blades prevailingly obovate (a few oval to elliptic-oblong), at base cuneate to rounded-cuneate, at apex obtuse to rounded, mostly 1-2 (rarely to nearly 4) cm. long and 7-17 mm. wide, with dense yellowish-cinereous, velvety pubescence and veins mostly salient beneath. Spikes (so far as known) under 1 cm. long.

Type: *Amos A. Heller* 2,831 *pro parte (cum var. Helleri commixt.)*, erect, compact bush 3-4 feet tall, on open exposed slope, about 2,500 feet alt., on ridge up to Kaholuamanu, between forks of Waimea River, Sept. 24, 1895 (U.S.).

Distribution: Known only from type locality in western Kauai.

Specimens examined: *Heller* 2,831 *pro parte* (type, U.S., my photograph no. 4,055: isotypes, Bish.; Mo., my photograph no. 4,057; N.Y., 2 sheets, my photograph no. 4,056).

2. **Nototrichium viride** Hillebr. Fl. Haw. Isls. 373. 1888.

Leaf-blades narrowly cuneate to rounded at base.

Leaf-blades elliptic- or broad-ovate; peduncles mostly 0.5-3 cm. long ..... *N. viride* sensu stricto.

Leaf-blades prevailingly oblong; peduncles longer, even up to 7 cm. ..... var. γ. *oblongifolium.*

Leaf-blades very widely cuneate or even truncate at base.... ..... var. β. *subtruncatum.*

Small tree about 3 m. tall, with spreading branches. Leaves thin, elliptic- or broad-ovate, apically acute or acuminate, tapering below into an appressed-pubescent and narrow but margined petiole 3-9 mm. long, in life rufous-tinged but turning to more or less brownish-green when dried, glabrate above unless near larger nerves, shortly appressed-hairy beneath, blade 3-5 cm. long and 1.2-3 cm. wide. Spikes single or ternate, terminal and axillary, 0.7-2.7 cm. long and under 9 mm. thick, short-ovoid to cylindric, densely white-villous; peduncles delicate, white-villous, 0.5-3 cm. long. Bracts scarious and ovate

below, the hairy, indurated midrib prolonged into a subulate tip and reaching to ±2 mm. Sepals 3-4 mm. long, here villous and there glabrous, somewhat apart at top, the stamens one-half and the pistil one-half to one-fifth shorter.

Type: *H. Mann & William T. Brigham* 590, Hanapepe, Isl. Kauai (Corn.).

Distribution: Known only from type locality in southern Kauai.

Specimens examined: *Amos A. Heller* 2,426, along the Hanapepe River, near the falls, Isl. Kauai, June 24-26, 1895 (Bish.; Chi., 2 sheets, my photograph no. 3,937; Corn.; Del.; Mo., my photograph no. 3,946; N.Y., 2 sheets; U.S.); *Mann & Brigham* 590 (isotypes, Kew, my photograph no. 4,044; N.Y.; U.S.).

Heller (Minnesota Bot. Studs. 1: 821. 1897) describes this as "a small tree about ten feet high, with spreading branches." He says that "it is not uncommon at elevations of 300 to 600 feet, usually growing on steep slopes." Hillebrand *(loc. cit.)* erroneously described the leaves as "glabrous and green on both faces." They are more or less appressed-pubescent, especially on the lower face, and their color varies from a "rufous tinge in life" *(fide Helleri)* to a brownish-green in the dry state.

Nototrichium viride var. β. **subtruncatum** Sherff, Bot. Leaflets 2: 4. 1950.

Leaf-blades very widely cuneate or even truncate at base. Spikes ovoid, under 1 cm. long. Lateral bracts a little more subulate-caudate.

Type: *G. W. Russ*, Kawaihapai, Isl. Oahu, March, 1932 (Bish.).

Distribution: Known only from northwesternmost Oahu.

Specimens examined: *William H. Hatheway* 157, a 6-foot shrub, locally abundant in shade of *Sapindus oahuensis* . . . and other dryland forest trees in relict forest, steep slope of small gulch, alt. 1,200 feet, Mokuleia, Waianae Range, Aug. 8, 1950 (Chi., etc.); *Hatheway* 168, a 7-foot shrub, much-branched from base; very abundant in understory of relict dryland forest of *Sapindus oahuensis* . . . and many other native dryland trees on steep slopes of small gulch, alt, 1,200 feet, same locality, Aug. 12, 1950 (Chi., etc.); *Russ*, Kawaihapai, March, 1932 (type, Bish., my photograph no. 4,046).

Nototrichium viride var. γ. **oblongifolium** Sherff, Bot. Leaflets 2: 3. 1950.

Leaf-blades commonly oblong more rarely subrhomboidally or elliptically oblong, under 6 cm. long and 2.5 cm. wide; peduncles very slender and more elongate, at times 5-7 cm. long; spikes (only submature ones known) up to 1.6 cm. long.

Type: *Abbé Urbain Faurie* 1,070, in rocky places of the mountains, Waimea, Isl. Kauai, March, 1910 (Del.).

Distribution: Southwestern Kauai.

Specimens examined: *Faurie* 1,070 (type, Del., my photograph no. 4,062: isotype, Bish., my photograph no. 4,063).

3. **Nototrichium humile** Hillebr. Fl. Haw. Isls. 373. 1888; *Nototrichium humile* var. *typicum* Sherff, Bot. Leaflets 1: 4. 1950.

Leaf-blades commonly 1.5-3 cm. long and under 1.5 cm. wide .....var. γ. *parvifolium.*

Leaf-blades larger, 3-7 cm. long and mostly 1.5-4.5 cm. wide.

Leaf-blades subrhomboidally oblong-lanceolate, at base narrowly to moderately cuneate, from at or below middle gradually narrowed to a subacute or less often obtuse apex .....var. β. *subrhomboideum.*

Leaf-blades mostly ovate, at base broadly cuneate to truncate, at apex usually obtuse to rounded or even retuse. *N. humile* sensu stricto.

A low shrub, now decumbent now erect and 1.5-2 m. tall, loosely branched, the young branches slender, herbaceous, nodulose, puberulent, at first angulate but later subterete. Leaves sparingly silky when young, petioled, petiole slender and 4-8 mm. long; blade (often subrhomboidally) ovate or oblong, thin, soon glabrate, at base broadly cuneate to truncate, at apex usually obtuse to rounded or even retuse, at margin entire, drying brownish or brownish-green, of principal leaves 3-7 cm. long and 2-4.5 cm. wide. Spikes terminal (single or ternate) and axillary, slender, finally 3-7 cm. long and but 4 mm. thick, on delicate peduncles mostly 5-15 mm. long. Flowers crowded, short-conical, about 3 mm. long, stiff-coriaceous, appressedly pilose, deceptively simulating fruits. Lateral bracts conchoid, cordate-ovate, scarious-margined, keeled, ±1 mm. long. Sepals broadly ovate, obtuse, tightly investing fruit. Stamens and styles very short. Ovary globose; seed strophiolate.

Type: *William Hillebrand,* near coast, Cape Kaena, northwesternmost Oahu, Haw. Isls. (Berl.)[3]

Distribution: Northwestern Oahu.

Specimens examined (all from Isl. Oahu): *Otto Degener* 8,666, loosely branched, up to 7 feet tall, in shaded rocky ravine having prominent dyke, near gulch north of middle ridge between Puu Kamaohanui and Puu Pane, Dec. 11, 1932 (Mo.); *Degener* 8,667, growing with *Maba, Psidium,* etc., first large side valley on south of Makua Valley, Sept. 7, 1931 (Mo.; N.Y.; U.S.); *Degener* 8,668, in open shrubby forest, small gulch on south side of upper Makua Valley, May 10, 1931 (Corn.; Del.; Mo.; N.Y., 4 sheets; U.S.); *Degener, Salucop, & Dowson* 12,102, rocky ledge in dark forest, Kaumokunui Gulch, Mar. 13, 1938 (N.Y., 2 sheets); *F. R. Fosberg & K. Duker* 9,055, bush 2 m. tall, bushy dry slope at foot of cliffs, alt. 500 m., head of Makua Valley, Nov. 25, 1932 (Bish.); *William Hillebrand,* Cape Kaena (Kew).

Nototrichium humile var. β. **subrhomboideum** Sherff, Bot. Leaflets 1: 4. 1950.

Leaves thin, the narrow petiole 7-12 mm. long; blade oblongly subrhomboidal-lanceolate, at base cuneate, gradually narrowed toward the usually subacute apex, 3-6.5 cm. long and 1.2-3 cm. wide.

Type: *L. H. MacDaniels* 933, tree or bush 12 feet tall, on dry slope, alt. 1,300 feet, Mt. Kaala Trail from Schofield Barracks, Waianae Mts., Isl. Oahu, Aug. 14, 1927 (Bish.).

Distribution: Northwestern Oahu.

Specimens examined: *Otto Degener & William H. Hatheway (Hatheway distrib. no.)* 68, shrub 1.5 m. tall, alt. 1,600 feet, Kamini Gulch, *mauka* Dillingham Ranch, Mokuleia, Isl. Oahu, May 9, 1950 (Chi.); *Degener & Hatheway (Degener distrib. no.)* 20,640, a 5-foot leafy shrub with spreading branches, in forest at 1,600 feet alt., near Pahole Gulch, Mokuleia, Isl. Oahu, May 7, 1950 (Chi., etc.); *Degener & Hatheway* 20,636, single 5-foot shrub, in forest at 1,500 feet alt., same locality, May 14, 1950 (Chi., etc.).

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[3] Hillebrand's use of the symbol ! after Oahu showed (*cf.* Hillebr. *op. cit.* pp. viii and lx, footnote) that he had a specimen in his private herbarium, which later was presented to the Berlin Herbarium. With the recent destruction of the latter herbarium by war, his excellent duplicate at Kew (where labeled as the "Type!" and accompanied with ten pencil sketches of the floral and fruiting structures; my photograph No. 4,045) will suffice.

Nototrichium humile var. γ. **parvifolium** Deg. & Sherff *ex* Sherff, Bot. Leaflets 1: 4. 1950.

Similar to var. *subrhomboideum* but with small leaves, their petiole 3-6 mm. long, blade commonly 1.5-3 cm. long and under 1.5 cm. wide.

Type: *Otto Degener* 8,665, growing 5 feet tall, on dry cliff not far from Kolekole Pass, west branch of Waianae Valley, Isl. Oahu, Apr. 26, 1931 (Chi.).

Distribution: Northwestern Oahu.

Specimens examined: *Degener* 8,665 (type, Chi., my photograph no. 3,938: isotypes, Corn.; Del.; Mo.; N.Y.; U.S.).

Chicago Natural History Museum, Chicago, Illinois.

II. Epiphytum, a new section of the genus Dahlia Cav. (fam. Compositae).

By Earl Edward Sherff

Epiphytum sect. nov. generis **Dahliae** Cav.—Plantae epiphyticae, in truncis arborum crescentes, caulibus elongatis solidis ligneisque, radicibus elongatis ad terram decurrentibus, characteribus speciei typici *(D. Macdougallii)*.—Type, *Dahlia Macdougallii Sherff*.

In a recent article (Amer. Journ. Bot. 38: 69 and 71. 1951), the anomalous *Dahlia Macdougallii* was placed provisionally with the so-called tree-dahlias, of the new section Pseudodendron. In an additional article recently appearing elsewhere (as a Bulletin of the Chicago Natural History Museum), I have given further information about this strange species ("outstandingly different because of its epiphytic habit of growth, its roots up to two inches thick and thirty-five or more feet long, its stems solid, woody, up to two inches thick and thirty-five or more feet long, and with branches sprawling for considerable distances over tall forest trees"). To afford a more logical subdivision of the genus *Dahlia* along *sectional* lines, it seems desirable to erect for *D. Macdougallii* the separate section Epiphytum, leaving the section Pseudodendron for true tree-dahlias and the section Neocaulon for all other species in the genus.

Chicago Natural History Museum, Chicago, Illinois.

BOTANICAL LEAFLETS

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I. New entities in the genus Cheirodendron Nutt. ex. Seem. (fam. Araliaceae) from the Hawaiian Islands.

By Earl Edward Sherff

The present paper is preliminary to a monographic revision of the genus *Cheirodendron* which has been completed and will appear elsewhere in the near future. The abbreviations used for depositories cited in the text are the same as previously listed (Bot. Leafl. no. 4: 2), with the following additions: Arn., Arnold Arboretum of Harvard University; Calif. Acad., California Academy of Sciences; Goth., Botanical Garden of Gothenburg (Göteborg); Minn., University of Minnesota; Mun., Munich Botanical Garden; Mus. Cong., Museum Congoense of Tervueren (now at National Botanical Garden, Brussels); Phila., Academy of Natural Sciences of Philadelphia; Univ. Calif., University of California.

Cheirodendron trigynum confertiflorum var. nov.—Folia 3-5-foliolata; petiolo 6-13 cm. longo; foliolis submembranaceis, supra moderate nitidis vel interdum enitidis, circumambitu oblongis usque late ovatis vel interdum obovatis, basi rotundatis usque late triangulatis, apice breviter abrupteque caudato-acuminatis, margine irregulariter subrepandis vel subcrenatis et subintegris usque remote denticulatis (denticulis tenuibus et saepe inflexis), 3.5 (praecipue pro lateralibus)-10.5 cm. longis et 2(praecipue pro lateralibus)-6.5 cm. latis, petiolulo 1-3 cm. longo. Panicula usque ad 12 cm. longa pedunculo incluso, multiflora, umbellulis plerumque usque 4- vel 5-floris; pedicello tenui, circ. 3-3.5 mm. longo; flore circ. 4-4.5 mm. longo, ovario circ. 2-2.2 mm. longo; drupis siccis atrobrunneis, 4-5 mm. longis et 3.5-4 mm. crassis, pyrenis stigmatibusque plerumque 3, stigmatibus brevissimis crassis obtusisque.—Specimens examined, **WEST MAUI**: *Edwin H. Bryan*, Jr., 635, alt. 5,200 ft., upper edge of rain-forest, on edge of open bogs, Puu Kukui, Dec. 18, 1928 (Bish.); *Lucy M. Cranwell, Olof H. Selling, & Carl Skottsberg* 2,695, alt. circ. 1,750

m., summit forest on Puu Kukui, Jul. 25, 1938 (Bish.; Goth); *Otto Degener* 9,577, in forest north of Mt. Eke, Aug. 28, 1927 (Mo.; N.Y.; Phila.); *G. R. Ewart, III*, no. 80, alt. 4,000 ft., Haelaau—Puu Kukui Trail, Dec. 18, 1928 (Bish.; N.Y.); *G. R. Ewart, III*, no. 86, alt. 5,000 ft., rain-forest, near edge of open bog, Puu Kukui, same date (Bish.); *Charles N. Forbes* 419-*M*, Eke Trail to Halfway House, Sept. 25-Oct. 17, 1917 (Bish.; Chi.); *Forbes & C. M. Cooke, Jr.*, 20-*M*, Maunahooma, May, 1910 (Bish.; Chi.); *William Hillebrand*, West Maui (Bish., *ex herb. Hillebrandii in Herb. Berol., sub inscript. Cheirodendron Gaudichaudii* var. β. Hbd.); *Horace Mann & William T. Brigham* 379 *pro parte*, West Maui (type, Corn., my photograph no. 4,094; isotypes, Chi.; Gray; U.S.); *Marie C. Neal*, in rain-forest, on ridge, alt. 3,000-4,500 ft., Puu Kukui, Aug. 16, 1933 (Bish.; Chi.). **EAST MAUI:** *Forbes* 1,667-*M*, on top of ridge, right side of Kipahulu, Nov. 17, 1919 (Bish.; Chi.; approaching, in its more open inflorescence, var. *acuminatum* Skottsb. of northwestern Hawaii); *Rock*, Nahiku, Jan. 11, 1909 (Chi.).

Mann & Brigham issued two collections under their no. 379, one from Maui (W. Maui is given on one label, U.S.) and the other from Oahu. The latter is referred to var. *halawanum (vide infra)*.

Cheirodendron trigynum halawanum var. nov. — Folia 3-5-foliolata, petiolo 4-10 cm. longo; foliolis subteneribus, siccis nunc pallidis nunc brunnescentibus subnitidisque, varie ovalibus ovatis subhrhomboideo-ovatis vel subrotundato-ovatis, basi truncatis vel late triangulatis usque rotundatis et saepe obliquis, apice nunc rotundato-obtusis (interdum arcuato-mucronulatis) nunc subacutis nunc emarginatis, utroque margine oboslete usque acriter 1-9-denticulatis (denticulis crassiusculis glandulosis antrorsis vel inflexis), lamina 4-9 cm. longa et 3-6.5 cm. lata, petiolulo plerumque 1.5-4 cm. longo. Panicula terminalis, varie 5-12 cm. longa, ramis patentibus vel divaricatis, umbellulis plerumque usque 3-5- rarius usque 8-floris, pedicello tenui 1.5-4 mm. longo, ovario 2 mm. longo, corolla 3 mm. longa, petalis oblongis; drupis plerumque 3- raro 2-pyrenatis, atro-brunneis vel raro atris, 4.5- 6 mm. longis et circ. 3.5-5 mm. crassis; stigmatibus plerumque 3 raro 2 (rarissime 4 vel 5 etiam pro eadem inflorescentia), minimis, patentibus.—Specimens examined, **ISL. OAHU:** *H. F. Berg-*

man, Mt. Kaala, Feb. 11, 1928 (Bish.); *Richard S. Cowan* 692, ridge trail to Palikea, Honouliuli, August, 1947 (Bish.); *Otto Degener et al.* 9,574, in open rain-forest, north slope of South Halawa Gulch, Apr. 17, 1932 (N.Y.; U.S.); *Abbé Urbain Faurie* 263 *pro parte*, alt. 600 m., Kalihi, October, 1909 (Arn., my photograph no. 4,109); *Charles N. Forbes*, ridge west of Kalihi Valley, Aug. 18, 1908 (Bish.; Chi.); *Forbes*, same locality, Dec. 24, 1908 (Bish.; Chi., my photograph no. 4,108); *Forbes*, Makaha Valley, Feb. 12-19, 1909 (Bish.; Chi.); *D. Wesley Garber* 223, Pauoa-Konahuanui Trail, Feb. 15, 1920 (Bish.); *Gaudichaud*, Voyage of the Bonite, Oahu, 1836 (Gray); *Amos A. Heller* 2,313, on lower slopes of Konahuanui, above Manoa, May 13, 1895 (Chi.; Corn., my photograph no. 4,107; Mo.; N.Y.; Phila., my photograph no. 4,099; Univ. Calif.; U.S.); *Heller* (similarly) 2,313, same locality, May 28, 1895 (Gray); *William Hillebrand*, Oahu (Gray); *Hillebrand* 99, Nuuanu (Kew); *Hillebrand & Rev. J. M. Lydgate*, Oahu (Bish.); *Frank Kitamura*, wooded moist ridge, alt. 1,675 ft., Kaipapau Forest Reserve, Hauula, Oct. 15, 1933 (Bish.); *Mann & Brigham* 379 *pro parte*, Oahu (Bish.; Chi.; U.S., 2 sheets; confused in some herbaria with var. *confertiflorum* of Maui); *Mann & Brigham* 605, Konahuanui (Bish.); *Amy Suehiro*, on ridge, Kaipapau, Oct. 15, 1933 (Bish.); *United States South Pacific Explor. Exped. under Capt. Wilkes*, locality not stated, 1838-1842 (type, U.S., herb sheet no. 65,774, my photograph no. 4,091*b*: isotype fragment, a leaf with two leaflets left, Gray). **ISL. MOLOKAI:** *Lucy M. Cranwell, Olof H. Selling, & Carl Skottsberg*, 2,502, forest at head of Waikolu on trail to Pepeopae, Jul. 9, 1938 (Bish.); *Hillebrand & Lydgate*, Molokai (Bish.). **ISL. LANAI:** *G. C. Munro* 21, Kaiholena (Bish., 2 sheets). **HAWAIIAN ISLS.:** *Jules Remy* 495, 1851-1855 (Par.).

Cheirodendron trigynum Degeneri var. nov. — Folia 3-5-foliolata, petiolo 5-13 cm. longo; foliolis rotundato-ovatis usque late ovali-oblongis basi truncatis rotundatisve usque ad latissime triangulatis, apice obtusis vel saepius subabrupto-acuminatis, margine remote breviterque serrulatis (serraturis nunc rectis nunc inflexis), 7-10 cm. longis et 4-8 cm. latis, siccis viridi-brunneis nec nitidis; nervatione brochidodroma; petiolulo 1-4.5 cm. longo. Panicula laxa apertaque, usque ad 1.5 dm. longa, ramis divaricatis vel paulum reflexis, umbellulis

plerumque usque 6-8-floris, pedicello 3-5 (raro -6) mm. longo, ovario vix 2 mm. longo, corolla circ. 2.5 mm. longa, petalis oblongo-ovatis; staminibus inclusis; drupis siccis summe atris, trigynis, 4.5-6 mm. longis et sub 5 mm. crassis, stigmatibus 3 parvis squarrosis.—Specimens examined (all from **ISL. HAWAII**) : *Otto Degener* 1,600, in tree-fern forest, Kilauea, Dec. 18, 1923 (N.Y.) ; *Degener* 9,575, in wet jungle, between Glenwood and 29 Miles, June 28, 1929 (N.Y.) ; *Degener* 9,576, in dark, wet jungle between Glenwood and 29 Miles, June 23, 1929 (type, U.S., my photograph no. 4,092: isotypes, Chi., my photograph no. 4,093; Mo.; N.Y.) ; *Charles N. Forbes* 654-*H*, Olaa Flume, June 2, 1915 (Bish.; Chi.) ; *L. H. MacDaniels* 217, tree 12 m. tall, alt. 1,250 m., in fern forest, small forest reserve along Volcano Road, near Volcano Kilauea, Nov. 10, 1926 (Bish.) ; *G. W. Russ*, Punaluu Gulch, alt. 5,000 ft., September, 1927 (Bish.) ; *W. A. & C. B. Setchell*, Volcano Road, June 26, 1924 (Univ. Calif.).

This variety, in its typical and also the following forma, suggests var. *acuminatum* Skottsb. of northwestern Hawaii, but the leaflets are mostly much larger than in that variety.

Cheirodendron trigynum var. **Degeneri pauciflorum** f. nov. —Umbellulae plerumque tantum 2-5-florae, foliolis interdum late subdeltoideque rotundato-ovatis lamina 6-10 cm. latis.—Specimens examined (all from **ISL. HAWAII**) : *Degener & Wiebke* 2,094, in jungle between Glenwood and Kilauea, Jul. 27, 1926 (type, U.S., my photograph no. 4,105: isotypes, Goth., 2 sheets; N.Y.; Univ. Calif.) ; *Jules Remy* 494, Hawaii, 1851-1855 (Par.) ; *Carl Skottsberg* 560, fern forest, alt. about 1,200 m., Kilauea, Sept. 17, 1922 (Goth., 2 sheets) ; *Harold St. John & Edward Y. Hosaka* 11,447, moist woods, alt. 2,900 ft., Upper Hamakua Ditch Trail, Waipo, Kohala Mts., Jan. 1, 1932 (Bish., my photograph no. 4,113; Chi.).

Cheirodendron trigynum Hillebrandii var. nov. — Foliola 3 (fide Hillebrandii raro 5) varie obovata lato-ovata vel subrotundata, pallida, apice subacuminata vel raro emarginata, basi late cuneata, margine subintegra vel remote obsoleteque denticulata, usque ad ±6.5 cm. longa et ad 4.5 cm. lata, petiolulo 1.5-3 cm. longo; petiolo usque ad ±7.5 cm. longo. Panicula pedunculata pedunculo adjecto demum ±11 cm. longo, umbellulis usque 6-8-floris; stigmatibus 2 vel saepius 3 brevibus

crassisque.—Specimens examined (all from **ISL. OAHU**): *E. H. Bryan, Jr.*, summit of Lanihuli, Jul. 18, 1920 (Bish.); *W. A. Bryan*, alt. 2,000 ft., Konahuanui, Jan. 10, 1904 (Bish.); *Otto Degener*, near summit divide, Wilhelmina Rise, Nov. 11, 1931 (N.Y.); *Degener, Park, Potter, Bush, & Topping* 9,992, in rain-forest at summit, west of Poamoho Trail, Laie, Aug. 25, 1935 (Calif. Acad.; Chi.; Corn.; Del.; Mo.; N.Y.; U.S.); *Charles N. Forbes (with J. F. G. Stokes)*, Waiolani Ridge, June 28, 1908 (Bish.); *Forbes*, same place, Sept. 17, 1908 (Bish.); *J. Arthur Harris* C242,165, alt. circ. 2,400 ft., ridge of Koolau Range between Kahana and Wahiawa valleys, Aug. 31, 1924 (Bish.; Goth.; N.Y.); *William Hillebrand*, alt. 3,000-4,000 ft., Konahuanui and Mt. Kaala (Gray); *Hillebrand*, Mt. Kaala (Bish.); *Hillebrand* 258, Mt. Kaala (Kew); *Hillebrand* 262, Mt. Kaala (Kew); *Edward Y. Hosaka* 329, alt. 1,500 ft., South Opaeula Gulch, Paalaa, Nov. 9, 1930 (Bish.); *L. H. MacDaniels* 93, alt. 700 m., rain-forest, Konahuanui, Nov. 1, 1926 (Bish.); *MacDaniels* 292, alt. 1,000 m., Upper Hamakua Ditch Trail, near Waipio Valley, slope of Mt. Kaala, Nov. 19, 1926 (Bish.); *MacDaniels* 351, Lanihuli Ridge Trail, Jan. 23, 1927 (Bish.); *MacDaniels* 486, Palolo-Waialae Ridge, Jan. 27, 1927 (Bish.); *Joseph F. Rock* 647, Punaluu, Dec. 24-29, 1908 (Bish.); *Rock* 744, Koolau Mts., Punaluu, Dec. 3-14, 1908 (Gray); *Rock* 758, Punaluu, Dec. 3-14, 1908 (Bish.); *G. W. Russ*, Nuuanu, top of Lanihuli, Jul. 19, 1933 (Bish.); *D. LeRoy Topping* 2,831, Bowman Trail, Aug. 31, 1924 (N.Y.; Univ. Calif.); *Topping* 2,966, Konahuanui, Dec. 28, 1924 (Arn.; N.Y.; Univ. Calif.); *United States Explor. Exped. under Capt. Wilkes*, 1838-1842 (type, U.S., my photograph no. 4,091*a*: isotype, Gray).

The sheet (U.S. herb no. 65,774) bearing the type of var. *Hillebrandii* bears also, beneath, a large flowering specimen of the var. *halawanum* (my photograph no. 4,091*b*). Both were included in the basis of Asa Gray's *Hedera Gaudichaudii* var. $^{\beta}$ (Bot. U.S. Explor. Exped. 719. 1854). For the range of his var. $^{\beta}$ he gave *(loc. cit.)* "Oahu and the western part of Maui." Neither var. *Hillebrandii* nor var. *halawanum* is known to me from West Maui and it is likely that any West Maui material Gray might have seen was of the variety above named *confertiflorum*.

Several of the fruiting umbellets on the var. *Hillebrandii* type still possess seven or eight fruits each. There can be no

doubt that Hillebrand (Fl. Haw. Isls. 148. 1888) had this variety in mind when he described his *Ch. Gaudichaudii* form γ (listed as var. γ by Rock, Indig. Trees Haw. Isls. 363. 1913).

Cheirodendron trigynum Fosbergii var. nov.—Folia 3-foliolata, petiolo 4-10 cm. longo, foliolis pallidis late ovatis vel subrotundato-ovatis, basi truncatis vel subtruncatis, apice breviter abrupteque acuminatis vel rotundato-obtusis vel raro emarginatis, margine obsolete pauciterque acridenticulatis, lamina usque ad cm. longa et ad 7 cm. lata, petiolulo 2-5 cm. longo. Inflorescentia atro-brunnea, panicula terminali usque ad 13 cm. longa, ramis divaricatis umbellulis usque 3-5-floris, pedicello crassiusculo 2-3.5 mm. longo, ovario 3 mm. longo, corolla 2 mm. longa, petalis ovatis; drupis atris, plerumque 4- (raro 3- vel 5-) pyrenatis, plerumque 4- (raro 3- vel 5-) stigmatatis, sub 5.5 (-7) mm. longis et 4.5 (-5.5) mm. crassis.—Specimens examined (all from **ISL. OAHU**) : *Charles N. Forbes*, Koolauloa Mountains, between Punaluu and Kaipapau, Nov. 14-21, 1908 (Bish.; Chi.) ; *F. R. Fosberg* 14,223 *(Plantae Exsiccatae Grayanae num.* 855*)*, tree 5 meters tall, herbage with strong oily odor when broken, inflorescence dark-brown, fruits black, on wet wind-swept wooded ridge, main divide, alt. 825 m., crest of Koolau Mountains, above Kaipapau Gulch, Jul. 24, 1937 (type, Phila., my photograph no. 4,106: isotypes, Calif. Acad.; Chi.; Corn.; Del.; Gray; Mo.; N.Y.; Univ. Calif.; U.S.) ; *Joseph F. Rock* 313 (184), Koolau Range, Punaluu, Nov. 14-21, 1908 (Bish.; Chi.) ; *Rock* 561, Koolau Mountains above Punaluu Valley, Nov. 14-21, 1908 (Arn.).

A variety of narrowly restricted range, with usually smaller and more regularly shaped leaflets than in var. *halawanum* (apparently its closest relative) and fruits mostly 4-pyrenate, not mostly 3-pyrenate.

Cheirodendron trigynum Skottsbergii var. nov. — Arbor, foliis 3- vel 4- (forsitan interdum 5-) foliolatis, petiolo 3.5-9 cm. longo, petiolulis 1-3.5 cm. longis; foliolis pallidis, ellipticooblongis usque ovali-oblongis raro paucis obovatis vel ovatis, basi late cuneatis usque rotundatis, apice obtusis vel interdum vix acuminatis etiam mucronulatis, margine non vere crenatis sed obsolete vel interdum conspicuissime et plus minusve remote inflexo-denticulatis, lamina usque ad 10.5 cm. longa et ad 6.5 cm. lata. Panicula terminalis vel lateralis, laxa, pedunculo incluso usque ad 14 cm. longa, ramis divaricatis vel subre-

flexis, umbellulis plerumque 3-5-floris, pedicello tenui 3-5 mm. longo, ovario circ. 2.5 mm. longo, corolla vix 2 mm. longa, petalis ovatis. Drupae saltem siccae atrae vel rubido-atrae, 3-pyrenate et -stigmatatae, 4-5 mm. longae (stigmatibus 3 brevissimis crassis divergentibus inclusis), et 3.5-4.5 mm. latae.—Specimens examined: *Charles N. Forbes* 218-*L*, mountains at east end of Lanai, June, 1913 (Bish.; Chi.); *Forbes* 383-*L*, *Lanai*, September, 1917 (Bish., my photograph no. 4,122); *Albert S. Hitchcock* 14,681, tree, on upper part of mountain, Lanai, Sept. 21, 1916 (U.S., my photograph no. 4,103); Hitchock 14,765, tree, in upper forest, alt. 4,000-5,000 ft., Puu Kukui, West Maui, Sept. 24-26, 1916 (type, U.S., my photograph no. 4,110); *Hitchcock* 14,851, tree, in upper forest, alt. 3,000-5,000 ft., same place and date (topotype, U.S.).

The Lanai specimens, at first regarded by me as distinct, have leaflets slightly more thickish and a tendency to dry brown and slightly glossy. Otherwise they seem inseparable from West Maui material. The latter has leaflets close to those of the var. *multiflorum* Skottsb. of Kauai, but differs in its smaller fruits (these with 3 or rarely 2 pyrenae) and their diminutive, scarcely visible stigmata.—The variety is named for Dr. Carl Skottsberg, whose recently published observations on *Cheirodendron* (Meddel. Göteb. Bot. Trädgard 15: 416-419. 1944) have been of much value in my studies of the genus.

Cheirodendron trigynum Rockii var. nov.—Folia 3-5-foliolata, petiolo 6-12 cm. longo; foliolis subnitidis supra, ovato-lanceolatis, basi late cuneatis vel subrotundatis, apice acutis, utroque margine obsolete vel moderate ±6-dentatis (dentibus principalibus inflexis, circ. 0.5-1 mm. longis saltem pro latere antrorso, glandulum subtendentibus), lamina saepius 7-9 (interdum -11.5) cm. longa et 2-4.5 (interdum -6) cm. lata; petiolulo 1-2.5 cm. longo. Panicula terminalis, aperta, circ. 12-15 cm. longa pedunculo incluso, ramis late patentibus, umbellulis usque 4-6-floris; pedicello 2-3 mm. longo (etiam cum fructu); drupis siccis atris, parvis, circ. 4-4.5 mm. longis et 3-4 mm. crassis, pyrenis plerumque 3, stigmatibus plerumque 3 brevissimis (±0.3 mm.) sed divergentibus.—Specimens examined (all from **ISL. LANAI**): *Joseph F. Rock*, near summit, 1910 (Bish.; Chi.); *Rock*, on Mahana ridge, July, 1910 (type, Bish., my photograph no. 4,111: isotype, Arn., my photograph no. 4,102).

Cheirodendron trigynum subcordatum var. nov. — Folia 5-foliolata, petiolo 7-9 cm. longo, foliolis lamina ovatis vel ovato-oblongis, vix coriaceis, supra nitidis, basi (saltem pro foliis majoribus) truncatis usque cordatis, apice emarginato rotundatove usque obtuso subito uncinato-apiculatis, margine grosse crenato-serratis (serraturis brevibus vel moderate extensis et inflexo-uncinulatis circ. 6-12 utroque latere), usque ad 17.5 cm. longis et ad 10 cm. latis; petiolulo 0.5-3 cm. longo; panicula maxima usque ad ±2.5 dm. longa pedunculo (±9.5 cm. longo) incluso et ad 1.6 dm. lata, aperta, umbellulis saepe 10-15-floris, pedicello (ad anthesin) tenui 5-6 mm. longo; calice 3-3.2 mm. longo; corolla vix 2.5 mm. longa; drupis ignotis. — Specimens examined (all from **ISL. HAWAII**): *Joseph F. Rock* 3,860, in dense forest, alt. 4,000 ft., Waihou, north of Puuwaawaa, slope of Hualalai, June 18, 1909 (Bish., topotype, my photograph no. 4,129); *Rock* 3,861, forest of Waihou, same place and date (Gray, type, my photograph no. 4,130); *Rock* 3,941, Hualalai, same date (Arn., topotype, my photograph no. 4,131).

A variety readily mistaken for the species proper, from which it differs in the more or less cordate bases of its leaflets and the even larger panicle, that on the type measuring slightly over 2.5 dm. long, including its peduncle. The latter (or what was retained when the panicle was separately mounted on the sheet) measures fully 9.5 cm. in length.

Cheirodendron trigynum oblongum var. nov. — Foliola 3-5 rarius 6, lamina oblonga usque ad 10 vel 11 cm. longa et ad 4-6 cm. lata, apice plerumque rotundato-obtusa interdum emarginata interdum subacuta, margine obsolete usque acerrime serrulata serraturis 10-22 utroque latere; paniculis saepius numerosis parvisque, plerumque tantum 3.5-7 (raro -9.5) cm. longis, umbellulis saepius 9-14-floris; drupis trigonis atris vel atro-purpureis, circ. 5 mm. longis et paulum angustioribus, stigmatibus 3 rarissime 4.—Specimens examined (all from **EAST MAUI**): *Otto Degener* 9,580, just below rain-forest, north *mauka* of Ulupalakua, Jul. 4, 1927 (N.Y.; Phila.; U.S.); *Degener* 17,482, in foggy, open forest, Paliku, within Haleakala, Aug. 17, 1939 (Mo.; N.Y.; Phila.; U.S., 2 sheets); *Charles N. Forbes* 1,041-*M*, Keanae Gap, Crater of Haleakala, Aug. 3, 1919 (Bish.); *Forbes* 1,874-*M*, *Nuu*, south slope of Haleakala, Mar. 6, 1920 (Bish.; Chi.); *Forbes* 2,041-*M*, Au-

wahi, south slope of Haleakala, Mar. 20, 1920 (Bish.; Chi.); *Forbes* 2,050-*M*, same place and date (Bish.; Chi.); *William Hillebrand*, Ulupalakua (Bish.); *Hillebrand* 200, alt. 3,000-4,000 ft., "Haleakala South" (Kew); *Gerrit P. Wilder*, Ulupalakua, 1913 (type, Bish., my photograph no. 4,119).

Cheirodendron trigynum var. **oblongum latius** f. nov. — Foliola 3 vel 4, moderate latiora brevioraque, magis coriacea, facie superiore saepe nitida, druparum rarissime trigonarum plerumque tetragonarum stigmatibus rarissime 3 plerumque 4.—Specimens examined (all from **EAST MAUI**): *Forbes* 703-*M*, Ukulele, Jul. 11, 1919 (Bish.; Chi.); *Forbes* 900-*M*, east of Ukulele, August, 1919 (type, Bish., my photograph no. 4,120); *Otto Degener* 2,245, on fog-swept eroded *aa* lava slope, Koolau Gap, Aug. 11, 1927 (U.S.); *Degener* 9,579, in cold, fog-swept region, Koolau Gap, Aug. 17, 1927 (Chi.; N.Y., my photograph no. 4,121).

Cheirodendron trigynum Ilicoides var. nov.—A specie ipsa foliolis non crenatis sed utroque latere saepius 5-15 dentibus (his elongatis antrorsis irregulariter uncinulatis) instructo umbellulis 3-5-floris differt.—Specimens examined (all from **WESTERN HAWAII**): *L. H. MacDaniels* 320, spreading tree 10 m. tall, on rough lava, alt. 1,000 m., Puuwaawaa, Dec. 1, 1926 (type, Bish., my photograph no. 4,114); *Alfred Meebold* 20,889, alt. 5,000 ft., Hualalai, November, 1935 (N.Y.); *J. F. Rock* 12,977, "Waihou forest," Puuwaawaa, August, 1917 (Bish., my photograph no. 4,115).

The type has its leaflets very similar in shape and marginal teeth to those of typical var. *molokaiense* of Molokai, but the drupes have a volume twice as great as in that variety and the umbellets are fewer-(up to 4- or 5- not to 10-) flowered. From the species proper, so common on the Island of Hawaii, var. *Ilicoides* can be told by the sharp, elongate, antrorse marginal teeth on its leaflets (these not crenate) and its few-flowered umbellets. The varietal name alludes more particularly to *Ilex opaca* Ait., to the leaves of which the leaflets display a fanciful resemblance.

Cheirodendron trigynum molokaiense var. nov.—Folia 3-5-foliolata, petiolo 3-8 rarius usque ad 11 cm. longo, foliolis late oblongo-ovalibus (protypo) usque elliptico-oblongis, supra

subnitidis, basi rotundatis vel late triangulatis interdum obliquis, apice obtusis rotundatisve (protypo) usque plus minusve acuminatis, margine saepius (non semper) conspicue uncinulato-denticulatis (dentulis 3-11 pro utroque margine, gracilibus, antrorsis), lamina 4-8 (etiam usque ad 12.5) cm. longa et 2-6 cm. lata, petiolulo plerumque 1-3 cm. longo. Panicula saepius 6-7 interdum usque ad 9 cm. longa pedunculo incluso, demum aperta, umbellulis usque ad 4-10-floris, pedicello 1-3 (-4) mm. longo, ovario sub 2 mm. longo, corolla sub 1.5 mm. longa, petalis ovatis oblongisve; drupis siccis rubido-atris, minoribus, 4-5.3 mm. longis et 3-4 mm. crassis, plerumque 3-rarius 4-pyrenatis et -stigmatatis.—Specimens examined (all from **EASTERN MOLOKAI**): *Abbé Urbain Faurie* 264, alt. 1,000 m., Kamolo (Kamalo), June, 1910 (Arn.); *Faurie* 267 *pro parte*, Pukoo, May, 1910 (Arn., Bish., my photograph no. 4,123*A*); *Joseph F. Rock* 6,165, very common, on edge of gulch above Kamoko (Kamoku), Mar. 23, 1910 (type, Arn., my photograph no. 4,100: isotypes, Bish.; Gray, my photograph no. 4,101).

The small, reddish-black (when dry) frequently 4-pyrenate drupes, the more or less numerously flowered umbellets, and the usually conspicuous uncinulae of the leaf-margins distinguish this variety rather easily. Hillebrand (Fl. Haw. Isls. 148. 1888) included his Molokai material together with West Maui and Kohala Range (Isl. Hawaii) material in his unnamed var. β. His West Maui specimens undoubtedly were var. *confertiflorum* (described above) and his Kohala Range specimens var. *acuminatum* Skottsb. These two varieties were doubtless the basis of his "umbellets 4-5-flowered. Stigmas 3 or 2," while his "remotely but sharply dentate or serrate with long incurved teeth" may well have come from the Molokai material (var. *molokaiense*). It may be noted, however, that on Molokai the umbellets are rather inconstant in the maximum number of florets borne. On our type, for example, the largest umbellets have 4 or 5 florets, while on the isotype at Gray Herbarium they have 7-10.

Cheirodendron trigynum molokaiense angustior f. nov. — Foliolorum lamina angustior saepius elliptico-oblonga vel oblongo-lanceolata usque ad 12.5 cm. longa.—Specimens examined (all from **MOLOKAI**): *Lucy M. Cranwell* 3,398, very abundant, forest-forming, top of Wailau trail, Sept. 20, 1938

(Bish.); *Otto Degener* 9,581, in rain-forest, near Puu o Wahaula, Apr. 17, 1928 (N.Y., sterile sprays); *Degener* 9,582, south of Pepeopae, Apr. 13, 1928 (N.Y., two sterile specimens, one juvenile *with leaflets sparsely setose on one face*); *Degener* 9,585, in rain-forest, gully west of head of Waikolu Valley, Apr. 21, 1928 (Chi.; Mo.; N.Y., 2 sheets; U.S.); *Faurie* 267 *pro parte*, Pukoo, May, 1910 (type, Bish., my photograph no. 4,123*B*).

Cheirodendron trigynum osteostigma var. nov.—Folia parva, 3- vel 4-foliolata; petiolo sub 9.5 cm. longo; foliolis lamina saepius ovato-lanceolatis, basi rotundatis usque late cuneatis, apice plus minusve acuminatis et uncinato-mucronatis, margine subintegris usque pauciter antrorsumque uncinulato-serratis, 3-6 cm. longis et 1.6-3.5 cm. latis. Paniculae plures, sub 9 cm. longae, umbellulis 3-5-floris, pedicellis 2-5 mm. longis, calice 3 mm. longo, petalis oblongis. Drupae siccae rubido-atrae, 5.5 mm. longae et vix 4 mm. crassae, plerumque 3- raro 4-pyrenatae, stigmatibus 3 (raro 4) brevibus, subglobosis vel depresso-globosis, calloso-induratis stramineisque. —Specimens examined: *R. L. Usinger* 2, alt. 2,500 ft., Mapulehu-Punaula Ridge, southeastern Molokai, August, 1936 (type, Bish., my photograph no. 4,148).

Cheirodendron kauaiense Forbesii var. nov. — Folia 3- vel saltem pro ramis juvenilibus usque ad 5-foliolata, petiolo 3-7.5 (pro foliis juvenilibus usque ad 10) cm. longo, foliolis integris, membranaceis, supra nitidis vel enitidis, ovatis usque oblongis vel anguste oblongo-obovatis, basi late usque moderate cuneatis, apice rotundato-obtusis usque acuminatis, lamina 6-13 cm. longa et 2.5-6 cm. lata. Panicula sub 1 dm. longa pedunculo incluso et sub 8 cm. lata, confertiflora, umbellulis saepius circ. 7- vel 8-floris; drupis 5-pyrenatis, atris, sub 5 mm. longis et 4 mm. crassis, stigmatibus 5 patentibus; pedicello tenui demum 4-5.5 mm. longo.—Specimens examined: (all from **ISL. KAUAI**): *Charles N. Forbes* 257-*K*, vicinity of Wahiawa Swamp, August, 1909 (Bish.); *Forbes* 266-*K*, same place and date (Bish., my photograph no. 4,117; Chi.; Minn.); *Forbes* 270-*K*, same place and date (Bish., my photograph no. 4,118, juvenile branchlet showing variation from 3 to 5 leaflets, these thinner, broader and faintly rhombic, and apically more acuminate); *L. H. MacDaniels* 708-*A* (type, Bish., my photograph no. 4,116).

The 5-angled drupes combine with the peculiarly shaped leaflets and their utter lack of marginal serratures to stamp this variety as very distinct from all varieties of *Ch. trigynum* but allied with *Ch. Kauaiense* Krajina. It may have formed part of Hillebrand's form ε (Fl. Haw. Isls. 148, *sub Ch. Gaudichaudii*, 1888), but the leaflets are not merely "subentire" as described by him, nor are the "styles 2-5." On the few drupes left on *Forbes* 266-*K* and the large number left on the type, the styles or stigmas seem consistently 5.*

The leaflets of the type are especially glossy on their upper surface, but on the Forbes specimens they are practically lusterless.

Cheirodendron Fauriei Macdanielsii var. nov.—Foliola late orbiculari-deltoidea usque transverse oblonga, principalia 9-12.5 cm. lata, basi latissima et truncata usque subcordata.—Specimens examined: *L. H. MacDaniels* 668, tree 6 m. tall, in rain-forest, ridge above Kilauea, alt. 800 m., Kekoiki, northeastern Kauai, Feb. 13, 1927 (type, Bish., my photograph no. 4,124: isotype, Chi., my photograph no. 4,125).

Cheirodendron Helleri sp. nov.—Arbor circ. 6-7.5 m. alta, ramulis siccis subrubido-brunneis. Folia trifoliolata, petiolo plerumque 5-9 cm. longo, petiolulis usque ad 4 cm. longis, foliolis pallidis membranaceisque ovatis usque late ovato- vel subrhomboideo-ovalibus, basi latissime cuneatis apice raro emarginatis plerumque plus minusve obtusis sed saepius mucronatis, margine subintegris usque paucidentatis dentibus subtenuibus antrorsis inflexis rectisve, 5-8 (-9) cm. longis et 3-7 cm. latis, nervatione pinnata, nervis brochidodromis. Paniculae 1-3 ad ramuli apicem plerumque 6-8 raro usque ad 9.5 cm. longae pedunculo incluso et paulum latiores, pedunculo 2-3 cm. longo, umbellulis plerumque usque ad 11- raro ad 13-floris. Calicis tubus tenuiter obconicus usque urceolatus circ. 2.5 mm. longus, petalis ovatis ovato-oblongisve paulo brevioribus; drupis (immaturis visis) siccis fusco-brunneis, 2-pyrenatis, valde compressis circ. 8 mm. altis (stigmatibus 2 tenuibus patentibus 1-1.5 mm. longis inclusis) et usque ad 7.5 mm. latis, pedicello tenui 3-6 mm. longo.—Specimens examined (all from

*In determinations in some herbaria, J. F. Rock applied the designation ε to very different Kauai material, this identical with specimens later made *Ch. trigynum* var. *multiflorum* Skottsb. (Meddel. Göteb. Bot. Trädg. 15: 416, 1944).

CENTRAL KAUAI): *Amos A. Heller* 2,496, tree about 25 ft. tall, on the ridge west of the Hanapepe River, alt. about 3,000 ft. [*fide* Heller, Minnesota Bot. Studies 1 :870. 1897, and thus about two-thirds the distance from Hanapape Bay to summit of Mt. Waialeale], Jul. 4, 1895 (N.Y.; Par.; Univ. Calif.); *Heller* (similarly) 2,496, same place, July 11, 1895 (Bish.; Corn., my photograph no. 4,089); *Heller* (similarly) 2,496, same place, Aug. 22, 1895 (type, U.S., my photograph no. 4,088: isotype, Mo.).

In foliage, this species is more characteristic of the *Ch. trigynum* complex and resembles rather closely *Ch. trigynum* var. *halawanum*. In its large, consistently 2-pyrenate fruits, however, it resembles *Ch. Fauriei* Hochr., a species related through leaf-type more closely to *Ch. platyphyllum* (H.&A.) Seem. than to *Ch. trigynum* (Gaud.) Heller.

Cheirodendron Helleri microcarpum var. nov.—Foliola vix minora, paulum crassiora, umbellulis usque ad 7-floris, drupis maturis tantum 5-6 mm. longis (stigmatibus circ. 1 mm. longis inclusis) et aequaliter latis.—Specimens examined: *Annie M. Alexander & Louise Kellogg* 5,197, several trees about 20 ft. tall, trail from Kalalau Lookout (*i.e.*, Kilohana Lookout), alt. 4,000 ft., Isl. Kauai, Mar. 7, 1947 (type, Univ. Calif., my photograph no. 4,097).

Chicago Natural History Museum, Chicago, Illinois.

II. Some new or otherwise noteworthy members of the genus Bidens L. (fam. Compositae) from tropical east Africa.

By Earl Edward Sherff

Recently the Systematic Botanist, Mr. P. J. Greenway, Esq., of the East African Herbarium at Nairobi, Uganda, very kindly forwarded me an assemblage of *Bidens* specimens for study. The present paper represents the main results of this study. The specimens had belonged to the Coryndon Museum Herbarium, with which the very valuable Amani Herbarium of Tanganyika Territory has recently been consolidated under the new name, The East African Herbarium, abbreviated "E.Afr." in the following pages.

Bidens kilimandscharica var. **oxymera** Sherff (Amer. Journ. Bot. 34: 155. 1947).—This variety has been known heretofore from the single type specimen, *Miss E. R. Napier* 6,085, collected at Donyo (Ol Doinyo Sapuk, Machakos Province), Kenya. Three additional collections have been seen, one of them (*Van Someren* 1,749) extending the range into Tanganyika: *Napier* 1,924, on grassy hillside, granitic soil, woody herb. . . . alt. 7,000 ft., Kapenguria, West Suk District, Kenya, May 13, 1932 (E.Afr., my photograph no. 4,141); *Napier* 1,943, woody herb over 6 ft. tall, alt. 7,000 ft., same locality, May, 1932 (E.Afr., a form with more regularly sharp-dentate and less lobulate leaves, my photograph no. 4,142); *C. G. Van Someren* 1,749, erect herb in grassy scrub, 3-4 ft. tall, alt. 3,500 ft., Meru [just west-southwest of Mt. Kilimanjaro, extreme northeastern Tanganyika], Jan. 22, 1932 (E.Afr.).

Bidens lineariloba Oliv.—A species of Tropical East Africa known hitherto as far north as Ukerewe Island in Lake Victoria Nyanza. An additional specimen extends the range into Uganda at the north of that lake: *P. Chandler* 39, alt. 3,600 ft., Serere, Teso County, Eastern Province, Uganda, December, 1931 (E.Afr.).

Bidens Kirkii var. **flagellata** Sherff (Bull. Jard. Bot. Brux. 13: 287. 1935).—In my monograph of the genus *Bidens*, a single specimen (the type, *Muller* 50) was cited for this variety (Bot. Ser. Field Mus. 16: 562. 1937). It had come from Kitega, in Ruanda, at that time northwesternmost German East Africa. I have before me the following additional specimens from the East African Herbarium: *Bally B*4,173 between rocks, summit, Oldonyo Orok (Ol Doinyo Orok), Masai Province, Kenya, alt. 8,300 ft., 1944; *Mrs. Brodhurst-Hill* 585, alt. up to 9,000 ft., Timboroa (in Ravine District, Kenya) etc., December, 1931; *A. Champion,* erect herb, alt. 9,000 ft., Mt. Kathagalon, West Suk, Oct. 3, 1934; *I. R. Dale K*3,290, in grasslands on quartz, Cherangani Hills, alt. 8,000 ft., September, 1934; *Miss Harvey* 165, erect herb 18 inches tall, alt. 8,500 ft., Kinangop, Naivasha District, Kenya, May, 1932, achenes occasionally 3-aristate, or with a narrowly urceolate *poculum* at the very apex, or both; *Miss E. R. Napier,* 1,265, woody herb, about 4 ft. tall, in long grass, alt. 6,000-7,000 ft., Rumuruti, Laikipia District, Kenya; *R. Pierce,* alt. 7,800 ft., Ol-

Goro-Orok, January, 1931; *Allen Turner* 365, small somewhat decumbent herb, alt. 6,000 ft., Kinangop, Jul. 29, 1930.

It may be that certain of the *exsiccatae* formerly cited by me for the species proper *(loc. cit.)* will be found referable to the var. *flagellata.*

Bidens superba Sherff. — This species till now has been known only from the two type sheets of material (*Jurion* 41, Mus. Cong., my photographs no. 2,783 and no. 2,784), collected at Nioka, Luri, Belgian Congo. It has recently been collected by Mrs. C. Jack (her no. 121) in bush country, alt. 7,000 ft., at Mt. Elgon, in Kenya (E.Afr.).

Bidens Rueppellii (Schz. Bip.) Sherff, **incisior** var. nov. — Caulis glaber, foliis (petiolo brevi incluso) usque ad ±5.5 cm. longis, foliolis plus minusve lanceolato-oblongis et magis profunde incisis, terminali circ. 1-1.4 cm. lato. Involucri bracteae exteriores tantum 0.3-1 mm. latae. Achaenia incognita.— Specimens examined: *R. Pierce,* alt. 7,700 ft., Thompson's Falls, Nakuru District, Kenya, October, 1931 (type, E.Afr., herb. no. 2,568, my photograph no. 4,135).

Bidens ugandensis (S. L. Moore) Sherff, **longisquama** var. nov.—A specie ipsa involucri squamis exterioribus angustioribus elongatioribusque 6-8.5 (non tantum 4-5.5) mm. longis differt.—Specimens examined: *Mrs. C. Jack* 324, 1.5 ft. tall, alt, 8,000 ft., Kapenguria, West Suk District, Kenya, September, 1932 (type, E.Afr., my photograph no. 4,134).

Bidens lineata Sherff, **tenuipes** var. nov. — A specie foliis principalibus tenuiter petiolatis petiolo usque ad 9 mm. longo (non subsessilibus vel marginato-petiolatis petiolo sub 6 mm. longo) bracteis exterioribus forsitan brevioribus differt.— Specimens examined: *Bally* 141, common erect herb, in grassland, alt. 3,200-6,500 ft., Ithaba (in Machakos Province) to Chyulu Hills, Kenya, May, 1938 (type, E.Afr., my photograph no. 4,140).

The type was determined at Kew in 1941 as *B. lineata,* but the delicate leaf-petioles, mostly about 0.5-0.8 mm. thick, are very distinctive.

Bidens palustris Sherff, **nematomera** var. nov. — A specie foliorum segmentis fere omnino filiformibus 0.2-0.8 rarius -1.2

(non plerumque 1-2) mm. latis differt.—Specimens examined: *Mrs. Brodhurst-Hill* 215, growing in big, spreading clumps along the sides of roads in very poor soil and murram, 2.5 ft. tall, Kipkarren, alt. 5,500 ft., October, 1931 (type, E.Afr., my photograph no. 4,139) ; *Rudolph Endlich* 142, bush-steppe, alt. 1,600 m., on the Ol Molog ("a couple of low hills"), northwest slopes of Kilimanjaro, Tanganyika, January, 1909 (Mun., my photograph no. 1,524*x*).

Bidens Schimperi Schz. Bip., **brachyceroides** var. nov. — A var. *brachycera* foliorum segmentis plus minusve oblongo-linearibus (non late usque moderate lanceolatis) achaeniorum aristis saepius 0.6-1 mm. longis ac retrorsum hamosis rarius deficientibus (non sub 0.2 mm. longis et nudis) differt.—Specimens examined: *R. M. Graham* 1,790, Kwale, Kenya (E.Afr., my photograph no. 3,879) ; *Mr. Koritschoner* 707, alt. 400-1,000 m., Msugubu, West Usambara, Tanganyika, June, 1935 (E.Afr.) ; *C. G. Van Someren Sh*43, edge of grasslands and forests, alt. 1,000 ft., Makadara, Shimba Hills, Kenya, July, 1939 (type, E.Afr.: isotype, E.Afr., my photograph no. 3,880).

In my above cited monograph of the genus *Bidens*, both this variety and the var. *brachycera* (Sherff, Bot. Ser. Field Mus. 17: 585. 1939) go in the analytical key to the first letter *e* on p. 62. Their usually long ligules would place them with the second *f* given thereunder, but the retrorse barbs displayed by their achenial aristae (when present) place them with the first *f*. In a former paper (Amer. Journ. Bot. 34: 154. 1947), the above listed *exsiccatae* were retained under the var. *brachycera*. My recent finding of a second specimen of *Van Someren Sh*43, with aristae present and retrorsely barbed, not absent as in the first specimen, has led to the conclusion that these *exsiccatae* had best be separated varietally from the var. *brachycera*, a variety with smooth achenial aristae.

Bidens Napierae sp. nov.—Herba erecta (ut videtur perennis) circ. 11 dm. alta, caule simplici subquadrangulato purpureo sulculato ad medium 3-4 mm. crasso glaberrimo vel ad ramorum bases densissime rufo-setoso internodiis 7-12 cm. longis. Folia opposita petiolata petiolo adjecto 6-12 cm. longa, petiolo 1-3 cm. longo angustissimo usque submarginato et 1.5 mm. lato (basi ipsa dilatata circ. 4-5 mm. lata) glabro vel ad

apicem hispidulo; lamina (circumambitu deltoidea) pinnatim 3- vel 5-partita, glabra vel ad rhachin hispidula; foliolis circumambitu plus minusve lanceolatis usque ovatis, acriter paucidentatis vel -lobulatis, submembranaceis (nervis lateralibus paucis subsimplicibus inferne elevatis), lateralibus sub 5 cm. longis inferne inaequaliter ad rhachin marginatam angustatis. Capitula pauca (±5), ad apices inflorescentiae ramulorum 1.5-3 cm. longorum (pro pedicellis) disposita, radiata, pansa ad anthesin circ. 5 cm. lata et circ. 1.5 cm. alta. Involucrum demum circ. 2 cm. latum et circ. 1.3 cm. altum, bracteis in 3 vel 4 seriebus dispositis, subaequalibus, ±14 exterioribus herbaceis lineari-attenuatis hispidulis patenti-reflexis demum ±1 cm. longis apice subacutis, interioribus lanceolato-oblongis partim glabrescentibus. Flores ligulati circ. 13 (unico capitulo cum floribus viso), flavi, ligula linearioblanceolata ±2 cm. longa et ±5.5 mm. lata. Paleae lineares, ad apicem acutum coloratae, sub 9 mm. longae. Achaenia submatura oblonge linearia vel subcuneato-linearia, obcompressa, atra, utraque facie circ. 6-8-sulculata et glabra vel supra aegre erecto-setulosa, marginibus exalatis interdum erecto-setosa, corpore 5-6 mm. longa et ±1.2 mm. lata, apice densissime erecto-setosa (setis stramineis rectis acribusque) et biaristata aristis paulum divergentibus rectis acribus stramineis nudis circ. 1.5-2 mm. longis.—Specimens examined: *Miss E. R. Napier* 218, erect herb about 3.5 ft. tall, leaves withering at maturity of flowers and so making plant look untidy, on north slopes, Mt. Longonot, alt. 7,900 ft., Kenya, June 29, 1930 (type, E.Afr., my photograph no. 4,137). In my monograph of the genus *Bidens* (Bot. Ser. Field Mus. 16: 1-709, pls. 1-189. 1937), this species would run in the key to the last *p* on page 71. From *Bidens taitensis* there given, it differs at once in its much less decompound leaves, its ±13 (not 8) ligulate florets, its narrower achenes (±1.2 but surely not 1.5-2.2 mm. wide), its longer achenial aristae (up to ±2 not under 0.5 mm.), etc. The species is named in honor of the former Miss Napier (now Mrs. Molony), whose extensive collections of East African plants have added greatly to our knowledge of the East African flora.

Bidens meruensis sp. nov. — Herba hispidulo-tomentulosa sine dubio perennis, caule (unico viso) erecto, gracili, simplici, uno internodio 9.5 altero circ. 13 cm. longo. Folia opposita, petiolata petiolo late marginato usque ad 2.5 cm. longo et ad

6 mm. lato, petiolo incluso 6-10 cm. longa, lamina pinnata, foliolis (vel segmentis principalibus) lateralibus 1 vel 2 vel sub-3 jugis, lineari- vel anguste lanceolato-oblongis, acerrime indurato-apiculatis, integris vel acerrime sed irregulariter 1-3-dentatis, sub 2.5 cm. longis et sub 7 mm. latis, terminali elongate lineari-oblongo, inter lobulos rhachi (sub 6 mm. latae et late marginatae) valde simili. Capitula (1 florescens et 1 fructificans visa) pedunculata pedunculis normaliter ut videtur 3 ad apicem caulis dispositis, radiata, pansa ad anthesin ±5.5 cm. lata et ±1.2 cm. alta. Involucrum albido-hispidulum, demum 1.5-2 cm. latum et ±1.3 cm. altum, bracteis exterioribus circ. 8, lineari-attenuatis circ. 1-1.3 cm. longis et 2-3 mm. latis, interioribus oblongo-lanceolatis vel lineari-oblongis plus minusve aequalibus. Flores ligulati circ. 7 vel 8, flavi, ligula anguste oblongo-obovata circ. 2 cm. lata, apice minutissime denticulata. Paleae angustissime oblongo-lineares, 11-13 mm. longae, apice acutae. Achaenia atra, lineari-oblonga, obcompressa, corpore 7.5-9 mm. longa et 1-1.5 mm. lata, utraque facie circ. 8-sulculata et mediane costata, marginibus et (praecipue superne) costis erecto-setosa aliter subglabra, exalata, apice erecte setosa setis stramineis et suberecte biaristata aristis gracilibus acerrimis stramineis nudis circ. 1-1.5 mm. longis.—Specimens examined: *C. G. Van Someren,* alt. 4,000 ft., Meru [just west-southwest of Mt. Kilimanjaro, extreme northeastern Tanganyika], 1932 (type, E.Afr., my photograph no. 4,136).

The leaves are shaped somewhat as in the glabrous *Bidens insecta* (S. L. Moore) Sherff of Southern Rhodesia. In my monograph of the genus *Bidens (vide supra),* this species would run down in the key to the first *h* and first *i* on p. 68. From the two species there given, *B. Rogersii* (of the Belgian Congo) and *B. nyikensis* (of the British Central African Protectorate) it differs at once in its leaf-surfaces, these being *hispidulo-tomentulose,* not *glabrous unless as to a ciliate edge.*

Bidens incumbens sp. nov.—Herba plus minusve scandens, ±2.5 m. alta, glaberrima, caule subquadrangulato, inferne lignescente. Folia opposita, tenuiter petiolata petiolo sub 2 cm. longo, petiolo incluso usque ad 1 dm. longa et ad 6 vel 7 cm. lata, bipinnatisecta, membranaceissima; foliolis circ. 5, diverse cuneato-ovatis usque oblongis, acriter pauciterque dentatis vel lobulatis, minutissime atro-punctulatis. Capitula

corymbose disposita (7 pro unica inflorescentia visa) pedunculos gracillimos 3-9.5 cm. longos terminantia, radiata, pansa ad anthesin ±3 cm. lata et ±1 cm. alta. Involucrum parvum (ad anthesin basaliter circ. 5 mm. latum), bracteis exterioribus circ. 8-10, patentibus, linearibus, circ. 4-5 mm. longis, sparsim pubescentibus, apice indurato-apiculatis, quam interioribus oblongis glabrioribus dimidio brevioribus. Flores ligulati probabiliter 8 (typi capitulis mancis), ±1.5 cm. longi, flavi, ligula lineari-oblanceolati, apice denticulati. Paleae (immaturae) lineares apice acutae ±8 mm. longae. Flores tubulosi graciles, corolla circ. 6 mm. longa, styli ramis plus minusve elongato-filiformibus (stigmatibus tumidis exceptis). Achaenia matura non visa, immaturissima plana, linearioblonga corpore sub 2 mm. longa, exalata, superne erecto-ciliata, apice erecte setosa et nunc 2- nunc 3-aristata aristis gracillimis elongato-filiformibus nudis vel rarius basim versus erecte 1- forsitan 2-barbatis 4-5 mm. longis apice acerrimis.—Specimens examined: *Miss E. R. Napier* 1,016, hillside, amongst and over scrub, a very scandent herb, growing up to 8 ft. or more over trees and bushes, alt. 2,000 ft., Voi, extreme southeastern Kenya (and just east of Mt. Kilimanjaro of Tanganyika), May 8, 1931 (type, E.Afr., my photograph no. 4,144).

Remarkable among its African congeners for its great height, scandent or incumbent habit, elongate-filiform style-branches, frequently 3-aristate achenes, and elongate-filiform aristae. Unfortunately, mature achenes are lacking and until these can be had some doubt must exist as to whether they would be without true wings as in *Bidens* or with true wings as in many species of *Coreopsis*. In my above cited monograph of *Bidens*, *B. incumbens* goes rather easily to the last *p* on page 71, but differs in many respects from the one species, *B. taitensis*, given there.

Bidens Rueppellioides sp. nov. — Herba probabiliter perennis, erecta, ±6 dm. alta; caule subquadrangulato, sulcato, inferne glabro, simplici, summam versus suberecte ramoso ramis rursus suberecte (in pedunculos) ramosis. Folia opposita, principalia 4.5-8 cm. longa et 4-7 cm. lata, sessilia vel brevissime petiolata petiolo marginato glabro sub 4 mm. longo, subbipinnatisecta; foliolis lateralibus 2 vel 3 jugis plus minusve oblonge linearibus usque lanceolatis (imis terminali

similibus inciso-dentatis sub 4 cm. longis et 2 cm. latis), acriter pauciterque dentatis (perpaucis dentibus in setam elongatam desinentibus), omnibus membranaceissimis, faciebus glabris punctulatisque margine minutissime irregulariterque antrorso-spinulosis; rhachi alata. Capitula pedunculos usque ad 1 dm. longos superne subhispidulos alibi glabros singillatim terminantia et corymbose disposita, radiata, pansa ad anthesin circ. 4-5 cm. lata et 7-8 mm. alta. Involucrum basi planum, demum circ. 9-10 mm. altum et 1.5 cm. latum, bracteis biseriatim (vel subtriseriatim) dispositis; exterioribus 10-12, anguste oblongo-linearibus, hispidulis usque glabratis, apice indurato obtusis nitidisque, circ. 5-7 mm. longis, quam interioribus oblongis vel late lanceolatis plus minusve glabrescentibus paulo brevioribus. Flores ligulati circ. 12, flavi, 2-2.5 cm. longi, ligula anguste oblonga apice vix denticulata. Paleae oblongo-lineares, circ. 6-7.5 mm. longae, superne plus minusve aurantiaco-rubidae, apice acutae. Flores tubulosi ovario excluso circ. 4 mm. longo; corollae tubulo circ. 2 mm. longo, ad apicem tumido-articulato vel anulato, basi inverse poculato. Achaenia atra, plana vel obcompressa, lineari-oblonga, utraque facie circ. 8-sulculata et (praecipue supra) erecto-setulosa, ventrali longitudinaliter costata, marginibus erecto-setulosa, corpore 3.5-5 mm. longa et 1.1-1.6 mm. lata, apice dense erecto-setulosa et biaristata aristis tenuissimis straminеis antrorsum hispidulis usque ad 1.5 mm. longis.—Specimens examined: *E. Battiscombe* 945, alt. 7,500-8,000 ft., Kinobop Plateau (type, E.Afr., my photograph no. 4,145).

A member of the section Steppia (Schz. Bip.) Sherff, as shown by the anulate tubes of the disk-corollas, the delicate, upwardly hispidulous achenial aristae, and the several setigerous-tipped foliar teeth observed on the type. This species, in its foliage and glabrous stems, suggests somewhat the above described *B. Rueppellii* var. *incisior*, but in its involucres is very different. In my above cited monograph of *Bidens*, *B. Rueppellioides* traces through the key directly to the first *g* on page 61. From the one species there given, *B. Rueppellii* of Abyssinia, it differs at once in its glabrous stem, its more deeply dissected foliage, its shorter and fewer outer involucral bracts, etc.

Bidens cinereoides sp. nov. — Species mediocriter cognita (unico caule cum unico capitulo florescente viso), probabiliter

perennis; caule moderate flexo (forsitan suberecto), glaberrimo, tetragono, gracillimo (sub 1.5 mm. crasso), simplici, sulculato, internodiis 3-6 cm. longis. Folia opposita, glabra, tenuiter petiolata petiolo sub 12 mm. longo, petiolo incluso principalia tantum circ. 3.5 cm. longa et ±1.8 cm. lata, lamina 3- vel 5-partita, foliolis lateralibus cuneate rhomboideo-ovatis sessilibus acriter 1-paucidentatis apice obtuso acriter apiculatis 7-11 mm. longis, terminali paulo majore. Capitula forsitan solitaria (pedunculo tenui, sulculato, glabro), radiata, pansa ad anthesin circ. 3 cm. lata et 8 mm. alta. Involucrum sparsim adpresseque setosum; bracteis exterioribus circ. 8, spathulato-oblanceolatis, apice subrotundato induratoque mucronulatis, margine suberecte setosis, circ. 3.5 mm. longis, quam interioribus lanceolato-oblongis fere circave dimidio brevioribus.

Flores ligulati 6, flavi, ±1.5 cm. longi, ligula cuneato-oblanceolata apice 3-lobulata lobulis 1-3 mm. longis apice obtusis. Paleae anguste lineares, apice plus minusve acutae, ±7 mm. longae. Achaenia non visa; ovariis planis, faciebus non setulosis nisi ad apicem, marginibus superne erecte setulosis, corpore lineari-oblongo 1-2 mm. longis, apice erecte setuloso biaristatis aristis sub 1 mm. longis patentibus supra acriter retrorsumque hamosis.—Specimens examined: *Dr. C. G. Van Someren* 1,166, alt. 7,000 ft., Kikuyu, Kenya, May 25, 1931 (type, E.Afr., my photograph no. 4,143).

In my above cited monograph of *Bidens, B. cinereoides*, assuming it to be a perennial, runs through the analytical key to the fourth *l* on page 66. From *B. cinerea* there given, it differs in its very glabrous (not spreading-hispid) stem, its green, glabrous (not cinereous-pubescent) leaves (these with a total length of about 3.5 not up to 6 cm.), etc.

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III. Dahlia Moorei, a new dahlia (fam. Compositae) from northwestern Hidalgo.

By Earl Edward Sherff

Dahlia Moorei sp. nov.—Herba perennis e radicibus tuberosis tenuibus, gracilis robustave, usque ad ±2 m. alta, caule

ramisque glabris vel ramis minime setulosis. Folia membranaceissima, opposita, petiolata (petiolo ±1.5 cm. longo, 1-2 mm. lato, adpresse puberulo), petiolo adjecto principalia ±2 dm. longa, plus minusve bipinnata, serrata, rhachi tenuissima puberula (internodulis usque ad 4.5 cm. longis); pinnis sparsim ciliatis et adpresso-setulosis, lateralibus in circ. 3 jugis (imis ±12 cm. longis, tenuissime petiolulatis petiolulo ±1.5 cm. longo, segmentis basalibus 1 jugo ovatis lanceolatisve circ. 2-4 cm. longis, segmento terminali moderate vel late lanceolato ±1 dm. longo apice caudato-attenuato unico margine circ. 13-16-dentato basi saepe irregulariter 1-lobato; summis pinnis sessilibus, lanceolatis, basi obliquis, apice subcaudatis, circ. 7-8 cm. longis); pinna terminali 2-3-partita, petiolulo tenui 1.3-2 cm. longo. Inflorescentia moderate exserta (in unico specimine viso circ. 21-capitulata), ramulis ultimis (pro pedicellis) gracillimis usque ad 1.2 dm. longis. Capitula radiata pansa ad anthesin circ. 5.5-6.5 cm. lata et ±1 cm. alta, mox cernua. Involucrum glabratum, demum cylindrico-campanulatum, 1.8-2.1 cm. altum et ±1.5 cm. crassum; bracteis exterioribus 5, lineari-attenuatis, 5 striatis, 8-13 mm. longis; demum patentibus vel reflexis; interioribus oblongis vel lanceolato-oblongis, lateribus diaphanis, usque ad 1.8 cm. longis, non ad basim connatis. Flores ligulati 8, ligulis (colore pallido-puniceis usque valde purpureis), plus minusve oblongis, ±2.5 cm. longis et 1.2-1.5 cm. latis, apice obtusis subacutisve et plerumque integris. Paleae oblongae, subdiaphanae, ±1.5 cm. longae. Flores tubulosi superne purpurascentes. Achaenia valde obcompressa, lineari-spathulata, brunneo-atra, utraque facie circ. 8-sulculata, minutissime puberula praecipue superne, 6.5-7 mm. longa et circ. 1.3-1.6 mm. lata, apice exaristata sed abrupte capite atro vix 1 mm. lato et sub 0.4 mm. alto instructa; capite plerumque poculo centrali minutissimo coronulato.—Specimens examined: *H. Emery Moore, Jr.*, 5,068, tall, slender or stout, weak herb to 6-7 feet high, from slender tubers; with deep rose to pale pink rays; leaves very thin; limestone ledges and streamside thickets in Barranca de San Vicente, near km. 238 on highway between Zimapán and Jacala, alt. 1,800-2,000 meters, District of Zimapán, State of Hidalgo, Mexico, Sept. 24, 1949 (type, Chi., my photograph no. 4,081).

A species standing near *D. pinnata* Cav. and *D. scapigera* (Dietr.) Knowles & Westc., from which as indeed from all

other known dahlias it differs in its anomalous achenes. These are normally constricted somewhat below the summit to form a broad, shallow, black head. (In the much larger sister genus *Bidens* L., a single species—*Bidens praecox* Sherff of the monotypic section Ebussa Sherff [Bot. Gaz. 93: 216. 1932]—is known to have such a structure. I do not recall its presence in other members of the Coreopsideae.)

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IV. Two Hawaiian species of the genus Sophora L. (fam. Leguminosae).

By Earl Edward Sherff

In 1919, J. F. Rock (Bot. Bull. 5: 44, pl. 15) described a new sophora from "Puuwaawaa; slopes of Hualalai, on old aa (rough) lava flow, elevation 2,000 feet," Hawaii, under the new name *Sophora chrysophylla* var. *unifoliata*. Later, Degener (Fl. Haw. fam. 169c, June 30, 1932) raised Rock's variety to specific rank, but used the generic name *Edwardsia*. Some time ago, after a preliminary study of Sophora as found in the Hawaiian Islands, I concluded that the generic name *Sophora* should have been used instead of *Edwardsia*. In a recent letter, Mr. Degener stated that he, too, had come to that conclusion. He now joins me in making the new combination:

Sophora unifoliata (Rock) Degener & Sherff, comb. nov.; syn. *Sophora chrysophylla* var. *unifoliata* Rock, *loc. cit.*

Another sophora meriting attention, and one quite different from *Sophora chrysophylla* Seem., native in the Hawaiian Islands, and from *S. tomentosa* L., in cultivation there, is one found in recent years by Mr. Degener and others on the Island of Oahu. Mr. Degener has placed his materials of it (*exsiccatae*, sketches, and notes) in my hands and now joins me in describing it as new:

Sophora grisea Degener & Sherff, sp. nov.—Arbor, ramulis brunnescentibus adpresse pubescentibus. Folia alterna, pinnata; foliolis circ. 13, nunc oppositis nunc alternis, demum (siccis) griseo-viridibus, subsessilibus, varie elliptico-oblongis usque oblongo-oblanceolatis, basi cuneatis, apice rotun-

datis vel paulum emarginatis, coriaceis, supra aegre infra dense adpresso-pubescentibus, 2-4 cm. longis et 1.2-2.4 cm. latis; rhachi adpresso-pubescenti superne canaliculata circ. 6-11 cm. longa, petiolo simili ±1 cm. longo. Florae intense flavae, pedicellis circ. 2 cm. longis; bracteola ad pedicelli basim lanceolata, circ. 2 mm. longa. Calyx aegre strigoso-pubescens, poculiformis, 8 mm. longus et 10 mm. latus, margine (limbo) supra retuso infra obtuse 5-lobulato. Corolla flava, glabra; vexillo ovato et anguste unguiculato, obtuso, circ. 18 mm. longo et 11 mm. lato; alis oblongis circ. 16 mm. longis et 6 mm. latis, apice truncatis, laminae basi truncatis, unguiculo 3 mm. longo; carinae petalis distinctis, oblique obovato-oblongis, circ. 20 mm. longis et 8 mm. latis. Stamina flava, 10; filamentis subaequalibus, circ. 18 mm. longis, subflavis, distinctis, basi dilatatis; antheris flavis, 1.5 mm. longis. Ovarium strigoso-pubescens, stigmate minuto; fructu usque ad ±9.5 cm. longo (rostro gracili acrique ±6 mm. longo excluso), inter ±7 semina valde sed plus minusve irregulariter constricto, 4-5.5 (vel 4 alis inclusis usque ad 7.5) mm. crasso, demum brunneo; stipite usque ad 1-1.5 cm. longo. Semina ovoidea sed moderate compressa, circ. 6.5-7 mm. longa, grisea usque atro-grisea, hilo finem versus posito.—Specimens examined (all from Isl. Oahu): *Otto Degener & Amy Greenwell,* Dupont Trail, Oct. 23, 1949 (type, Chi., my photograph no. 4,149: isotype, N.Y.); *Degener & Greenwell,* same place, Sept. 7, 1950 (Chi.); *Degener* 21,279, edge of summit rain-forest, main central ridge of Makaleha Valley overlooking Makaha Valley, Jan. 12, 1951 (Bish.; Chi.; N.Y.; U.S.).—Named in allusion to its gray or dark-gray seeds, these coarser and strikingly different in color from those of the well-known *S. chrysophylla* Seem. of certain other of the Hawaiian Islands.

Mr. Degener writes: "Some few years before, I believe I saw the same species—without flower or fruit—on the cliff northwest of Palikea (Waianae Range)—hopelessly out of reach." With *Degener* 21,279 were included two additional sprays of material, without flowers or fruits, but with leaflets about half as large and somewhat more numerous (often 15-21). They will need further study.

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6

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I. Notes on Bidens L. and Coreopsis L. (fam. Compositae) in the United States

By EARL EDWARD SHERFF

In this and the following articles the abbreviations used for depositories cited in the text are the same as previously listed (Bot. Leafl. no. 4: 2 and no. 5:2), with the following additions: Ga., University of Georgia; Stockh., University of Stockholm.

Coreopsis saxicola Duncanii var. nov.—Folia minora, segmentis angustioribus (plerumque 0.3-2 raro usque ad 3.2 mm. latis), eciliatis; involucris minoribus, bracteis exterioribus tantum 4-6 mm. longis.—Specimens examined: *Wilbur H. Duncan* 3,832, in shallow soil at edge of thickly vegetated drain at Echols Mill southeast of Point Peter, Oglethorpe Co., Georgia, Aug. 4, 1941 (type, Ga., my photograph no. 4,151).

The known range of *C. saxicola* Alex. begins with Stone Mountain, DeKalb County, northern Georgia, and runs southwestward into Tallapoosa County of adjacent Alabama. The type locality of var. *Duncanii** is approximately 100 km. east of Stone Mountain.

Coreopsis stenophylla Boynt. Biltmore Bot. Studies 1: 141. 1902.—In my revision of the genus *Coreopsis*, only Louisiana was cited for the distribution of this species (Bot. Ser. Field Mus. 11: 427. 1936). I have recently seen specimens of it from Nebraska and from southeastern Texas: *V. L. Cory* 54,949, up to 7.5 dm. tall, a colony in borrow pit of highway in sandy lowland, 1⅓ mi. northeast of Sour Lake, Hardin Co., Texas, Sept. 29, 1948 (Ga.); *A. A. Heller* 14,287, low moist places near Grand Island, Nebraska, Aug. 26, 1926 (Chi.). The plant, apparently an annual, was about 5 dm. tall, much

*Named in grateful appreciation for the collector, Dr. Duncan, who, as Associate Professor of Botany and Curator of the Herbarium at the University of Georgia, placed in my hands for study the collections of *Bidens* and *Coreopsis* belonging to that institution.

branched, the herbage bluish-green, heads numerous (±100), achenial wings often irregularly erose, a few of the numerous mature achenes anomalously large (their body 3-3.2 mm. long).

Coreopsis longifolia Godfreyi var. nov. — A specie ipsa differt caule (praecipue parte inferiore) et foliis dense hispidis pilis multiloculatis.—Specimens examined: *Robert K. Godfrey* 50,793, boggy, sphagnous depression in sandhills, 7 miles south of McRae, Wheeler Co., Georgia, Oct. 14, 1950 (type, Ga., my photograph no. 4,152).

The type plant is erect, about 9 dm. tall, densely hispid on lower two-thirds of stem (less so above) and on leaves, and has the numerous lower internodes (these mostly 0.4-4 cm. long) much exceeded by the alternate leaves (these elongate, linear-oblanceolate, apically attenuate-acute, basally attenuate into a petiole ± 4.5 cm. long). The blades of the lowermost leaves are missing, but where present are under 1.1 cm. wide. The involucre is fairly typical for the species proper, *i.e., C. longifolia* Small, the "outer" bracts being in 2 or 3 subseries and the "inner" ones tending to overlap one another to make 2 subseries.

Coreopsis grandiflora var. **Harveyana** (A. Gray) Sherff, Bot. Gaz. 94: 593. 1933.—This variety was once attributed by me (Bot. Ser. Field Mus. 11: 355. 1936) to "Missouri and Arkansas, perhaps also Kansas and Oklahoma." In a later note (*op. cit.* 17: 610. 1939), a specimen was reported from northeastern Alabama (*R. M. Harper & H. K. Svenson,* Flat Rock, north of Ashland, Aug. 3, 1938—Chi.). The Herbarium of the University of Georgia contains eight specimens from central to northeastern Georgia which I have determined for the same variety, and one from extreme northeastern Texas: *Arthur Cronquist* 4,575, red soil along roadside just east of Crawford, Oglethorpe Co., Georgia, Aug. 21, 1947; *Rogers McVaugh* 5,167, shallow soil about granite outcrops, 15 mi. east of Eatonton, Putnam Co., Aug. 19, 1940 (2 sheets); *McVaugh* 5,372, shallow soil about granite outcrops, Echols Mill, 13 mi. northeast of Lexington, Oglethorpe Co., Aug. 28, 1940; *Joseph H. Pyron & Rogers McVaugh* 1,820, shallow soil on flat granite rocks, 13 mi. east of Eatonton, June 5, 1937; *Pyron & McVaugh* 2,872, shallow soil about granite outcrops, Echols Mill, May 13, 1938; *Pyron & McVaugh* 3,181, at 13 mi. east of Eatonton, June 28, 1938;

Venard & McDowell V-437, Little Stone Mountain, near Lithonia, DeKalb Co., Sept. 1, 1947; *Eula Whitehouse* 21,450, alluvial soil, 18 mi. southwest of Clarksville, Red River Co., Texas, May 21, 1949.

Coreopsis Cardaminefolia (DC.) Torr. & Gray. — Known to me heretofore only from western Louisiana, Kansas, and Arizona southward across the Mexican border to the states of Tamaulipas, Coahuila, and Chihuahua. It is not listed in the 8th edition of Gray's Manual. Recently it has been found as an adventive in Albany County, New York (but unfortunately distributed as *C. tinctoria* Nutt., from which its winged achenes at once separate it): *Stanley J. Smith* 3,525, along railroad, Albany Port District, Jul. 23, 1947 (Ga.).

The plant is of the form with linear-filiform leaf-divisions, sometimes separated as var. *angustiloba* Torr. & Gray.

Coreopsis major var. **stellata** (Nutt.) Robins., f. **Oemleri** (Ell.), comb. nov.; *Coreopsis Oemleri* Ell. Sketch Bot. S. Carol. & Georgia 2: 435. 1824; *Coreopsis major* var. *Oemleri* (Ell.) Britton, Mem. Torr. Bot. Club 4: 131. 1894.—In my revision of the genus *Coreopsis*, I listed *C. Major* var. *Oemleri* (Ell.) Britton and recorded various published opinions regarding its status (Bot. Ser. Field Mus. 11: 409 and 410. 1936.) After further study, I must agree with Asa Gray's opinion there expressed, regarding it as "the abnormal entire-leaved form" of var. *stellata*. Indeed, certain specimens formerly cited by me for the var. *stellata* proper (*e.g.*, *E. E. Magee*, Hayward Co.; *B. L. Robinson* 79; *A. Ruth*, June, 1895, in part) are the simple-leaved form. While too closely tied to var. *stellata* to rank as a separate variety, it nevertheless may be designated as an interesting *forma*, of rather restricted range. Thus, while var. *stellata* f. *stellata* has a range of Virginia to southernmost Ohio and southwardly to Florida and Alabama, f. *Oemleri's* range includes *only North Carolina to Georgia and eastern Tennessee.*

For the f. *Oemleri* may be cited the following list of specimens examined: **North Carolina**—*E. E. Magee*, Haywood Co., September, 1897 (Gray, my photograph no. 2,232); *B. L. Robinson* 79, Asheville, Aug. 2, 1893 (Berl., my photograph no. 1,938). **Tennessee**—*Albert Ruth*, open woodlands, Knoxville, June, 1895 (Berl., on sheet with var. *stellata* f. *stellata*, my photograph no. 1,923). **Georgia**—*Arthur Cronquist* 4,838,

alt. 1,100 ft., rocky roadside on east side of Taylor Ridge, below Maddox Gap, between Villanow and LaFayette, Walker Co., Oct. 12, 1947 (Ga.); *Wilbur H. Duncan* 4,247, open oak-hickory woods on west slope of hillside above Amicolola Falls, alt. about 2,500 ft., Dawson Co., Sept. 28, 1941 (Ga.); *M. T. Holder E*8,341, Bobbin's Mill woods, 2 mi. southwest of Athens, Clark Co., Jul. 23, 1929 (Ga.); *L. E. Wehmeyer* 499, weedy field near Hot Springs, Madison Co., Aug. 9, 1924 (Ga.).

Coreopsis Delphinifolia var. **Delphinifolia f. concolor** f. nov. A varietate *Delphinifolia** disci florum corollis flavis non rubido-brunneis differt.—Specimens examined: *Arthur Cronquist* 5,345, edge of moist swale in sandhills 3 mi. northwest of Reidsville, Tattnall Co., southeastern Georgia, June 16, 1948 (topotype, Ga.); *Cronquist* 5,598, moist swale, same location, Aug. 3, 1948 (type, Ga.).

In both cases, the yellow disk was specially noted by Dr. Cronquist. The variation is a noteworthy one, since hitherto we have relied in large part upon the normally reddish-brown disk-corollas of *C. Delphinifolia* to separate that species from the allied (and in its var. *rigida* very similar) species, *C. major*, a species with yellow disk-corollas. The leaves of the *Cronquist* material, fortunately, are very definitely of the *C. Delphinifolia* pattern, even to the tripartite median leaflet of several principal leaves, thus letting no doubt remain as to the relationship with that species.

Bidens connata Muhl. var. **connata.** — This plant's range I formerly described (Bot. Ser. Field Mus. 16: 256. 1937) as "Nova Scotia and Quebec southward to New Jersey and westward. A single specimen observed from Alabama (collected by Rafinesque)." The University of Georgia Herbarium has some recently collected material from northwestern Georgia: *Wilbur H. Duncan* 9,015, . . . a few lower leaves deeply parted, along east side of Etowah River 6 mi. south, Canton, Cherokee Co., Sept. 26, 1948.

Bidens cernua L. Sp. Pl. 832. 1753.—Still another and apparently more remarkable range extension may be noted here, one for *Bidens cernua* L. As formerly stated by me (*op. cit.*

*I.e., *Coreopside Delphinifolia var. lineari* (Michx.) Sherff, Brittonia 6: 341. 1948 (C. Delphinifolia Lam Encycl. 2: 108. 1786 *sensu stricto*).

302), this species had a southern extension in the United States "to California, New Mexico, Tennessee, and North Carolina." It has been collected the past year in Georgia: *Wilbur H. Duncan* 13,187, in muddy, open area at edge of runway from large spring just south of Aubrey Lake, Bartow Co., Sept. 19, 1951 (Chi.).

Chicago Natural History Museum, Chicago, Illinois.

II. Further studies of Hawaiian Araliaceae: Additions to Cheirodendron Helleri Sherff and a preliminary treatment of the endemic species of Reynoldsia A. Gray

By Earl Edward Sherff

Cheirodendron Helleri sodalium var. nov. — Foliolorum lamina plus minusve obovato-rotundata usque latissime obovato-oblonga, basi latissime cuneata, apice truncata usque emarginata interdum abruptissime brevi-mucronata, margine integerrima, mediani 7.5-9 cm. longa et 7-8 cm. lata, lateralium paulo minor. Umbellulae 2-5-florae. Drupae 6 mm. altae stigmatibus (his 2, sub 0.7 mm. longis, divergentibus) inclusis et usque ad 5.6 mm. latae, compressae, 2-pyrenatae.—Specimens examined: *F. Fagerlind & Carl Skottsberg* 6,489, alt. about 600 m., in forest, near margin, Wahiawa Swamp, Isl. Kauai, Mar. 5, 1948 (type, Stockh., my photograph no. 4,150).

The smaller stigmas and peculiarly shaped leaflets separate this variety at once from the species proper.

Cheirodendron Helleri var. **multiflorum** (Skottsb.) comb. nov.; *Cheirodendron trigynum* var. *multiflorum* Skottsb. Meddel. Göteb. Bot. Trädg. 15: 416. 1944.

I have examined a fairly large assemblage (36 specimens) of this variety, including the type (Goth.). The leaflets are suggestive of those on *Ch. trigynum* vars. *Skottsbergii* and *oblongum* described by me in an earlier paper (Bot. Leafl. no. 5: 7 and 9. 1951) and so might seem to justify retaining the variety in the *Ch. trigynum* (Gaud.) Heller complex. The drupes, however, are quite unlike those of any variety of *Ch. trigynum* and appear to compel a transfer to *Ch. Helleri* Sherff (*op. cit.* 13).

The genus *Reynoldsia*, founded almost a century ago upon a single species from the Hawaiian Islands, *R. sandwicensis*, and a single one from Samoa, *R. pleiosperma*, has had but few additions made to it since then. None of these were from the Hawaiian Islands. Hawaiian material has been collected comparatively seldom and then frequently without flowers or fruits. The specimens have been labeled indiscriminately *R. sandwicensis* A. Gray. I have seen as yet no specimens from Kauai, Niihau, or Kahoolawe. Elsewhere a few dozen specimens complete enough for comparative studies have been collected and these have been examined carefully. They appear to constitute, besides *R. sandwicensis*, seven new species and five new varieties. These are set forth in the following pages, together with a conspectus and an analytical key. It cannot be emphasized too strongly that a reasonably complete revision of the genus, so far as Hawaiian Island material is concerned, must await the accumulation of much more extensive herbarium material.

CONSPECTUS OF SPECIES AND VARIETIES

1. *Reynoldsia sandwicensis* (Oahu and perhaps elsewhere) 9
   var. β. intercedens (Oahu) 10
   var. γ. *molokaiensis* (Molokai) 11
2. *Reynoldsia Hillebrandii* (southernmost Hawaii) 11
3. *Reynoldsia huehuensis* (northwestern Hawaii) 12
   var. β. *intermedia* (northwestern Hawaii) 13
   var. γ. *brevipes* (northwestern Hawaii) 13
4. *Reynoldsia venusta* (northwestern Oahu) 13
   var. β. *lanaiensis* (eastern Lanai) 14
5. *Reynoldsia Degeneri* (southeastern Molokai) 15
6. *Reynoldsia mauiensis* (East Maui) 16
7. *Reynoldsia oblonga* (southernmost Hawaii) 17
8. *Reynoldsia Hosakana* (northwestern Oahu) 18

KEY

a. Leaflets definitely oblong, teeth mostly small but acutish and subregular; native of southernmost Hawaii.
   7. *R. oblonga.*

a. Leaflets otherwise.
  b. Leaflets mostly repand or sinuate to broadly, crenately, and shallowly few-toothed margins.
    c. Pedicels short, under 2 mm. long; native of northwestern Hawaii...3. *R. huehuensis* var. γ. *brevipes.*
    c. Pedicels longer.
      d. Panicle large, its rhachis ±2 dm. long, its branches commonly 6.5-10.5 cm. long; native of northwestern Hawaii .....3. *R. huehuensis.*
      d. Panicle smaller.
        e. Panicle robust, its rhachis and branches drying reddish-brown to brownish-red, leaflets obtuse, blade of larger ones up to 11 cm. long and to 9 cm. wide; native of southernmost Hawaii. 2. *R. Hillebrandii.*
        e. Panicle more delicate and usually smaller, rhachis and branches usually greenish- or blackish-brown on drying; blade of leaflets often acutish to acuminate, seldom over 5 cm. wide; native of Oahu .....1. *R. sandwicensis.*
  b. Leaflets more definitely and sharply toothed.
    c. Pedicels short, 2-6 mm. long.
      d. Panicle small, rhachis ±6-7 cm. long, branches about 7-11, few- (2-8-) flowered; native of Molokai .....1. *R. sandwicensis* var. γ. *molokaiensis.*
      d. Panicle larger.
        e. Panicle 1 dm. or more in breadth and glabrate; calyx about 3-4 mm. broad and long at anthesis; corolla 6-7 mm. long; native of northwestern Hawaii. 3. *R. huehuensis* var. β. *intermedia.*
        e. Panicle narrower and conspicuously but irregularly stellate-pubescent; calyx and corolla much smaller; native of northwestern Oahu. 8. *R. Hosakana.*
    c. Pedicels longer.
      d. Florets small and delicate, either their calyx 1.5-2.5 mm. tall and 1.5-2 mm. thick or their corolla about 1.5 mm. thick in late bud stage; leaflets mostly subacute to acuminate at tip.

e. Leaflets ovate-lanceolate to ovate, apically acuminate; inflorescence elongate, 1.5-3.5 dm. long, its bracts and bracteoles mostly deciduous before anthesis; native of northwestern Oahu.
4. *R. venusta.*

e. Leaflets ovate to ovate-subdeltoid, apically obtuse to subacute or but shortly subacuminate; inflorescence half as long, its bracts and bracteoles mostly persistent at least into anthesis; native of southeastern Molokai .....5. *R. Degeneri.*

e. Leaflets cordate, apically obtuse to short-acuminate, inflorescence ±2 dm. long, many of its bracts and bracteoles persisting into anthesis; native of Lanai .....4. *R. venusta* var. *β. lanaiensis.*

d. Florets coarser, their calyx a half longer and thicker; leaflets mostly more obtuse at tip.

e. Maturing drupes 6-8-costate, their stylopodium conspicuous, conic, 1.6-2 mm. tall; branches of inflorescence subrobust, up to 8 or 9 cm. long, mostly antrorse- or retrorse-arcuate; native of East Maui .....6. *R. mauiensis.*

e. Maturing drupes 8-10-costate, their stylopodium inconspicuous, depressed-conic to weakly convex, under 1 mm. tall; branches of inflorescence delicate, usually shorter, commonly straightish or irregularly somewhat arcuate.
1. *R. sandwicensis* var. *β. intercedens.*

1. **Reynoldsia sandwicensis** A. Gray, Bot. U. S. Explor. Exped. 724. 1854; *op. cit.* Atlas, pl. 92. 1857.—*Reynoldsia* was founded by Asa Gray upon two new species, the first, *R. sandwicensis,* of the Island of Oahu in the Hawaiian Islands, and the second, *R. pleiosperma,* of Samoa. His description for the first, our concern here, gave "leaflets ... sparingly toothed especially towards the base." His Oahu material came from "a ravine near Waianae," on the southwest coast of Oahu. His cited plate shows the leaflets *shallowly and crenately few-toothed to subentire and somewhat repand- or undulate-margined.* These may be taken as characterizing *R. sandwicensis* var. *sandwicensis.* The following few collections from northwestern and southeastern Oahu have been examined: *Degener, Salucop, & Arlantico* 11,642, large tree in gulch, un-

usual in bearing flowers and fruits at same time, Kawaihapai, Jan. 11, 1938 (Gray; N. Y.; U. S.); *G. R. Ewart III*, no. 5, alt. 1,500 ft., sheltered side of ridge, in lantana thicket, dry country, Waialae-Wailupe Ridge, Dec. 29, 1928 (Bish.); *C. N. Forbes with Dr. C. M. Cooke & H. A. Pillsbry* 1,837-*O*, large clump of trees on cliffs, alt. up to about 500 ft., Kawaihapai, Feb. 14, 1912 (Bish.; Chi.; U. S.); *Mann & Brigham* 607 *pro parte*, Kaala Mts. (Chi., 2 sheets; Corn.; Del.; Gray, 2 sheets; N. Y.); *United States South Pacific Exploring Expedition under Capt. Wilkes*, in a ravine near Waianae, 1838-1842 (from type collection, Gray).

Reynoldsia sandwicensis intercedens var. nov. — Foliola certius acriusve crenato-serrata dentibus pro unico latere saepius 8-14.—Specimens examined (all from **Isl. Oahu**): *William Bush & D. LeRoy Topping* 3,762, shrubby hillside, Maakua Gulch, Jul. 15, 1934 (Bish.; Calif. Acad.); *Otto Degener* 11,128, moderately dry gulch, southwest of Dillingham Ranch, Kawaihapai, Mar. 12, 1937 (Bish.; Corn.; Del.; Gray; Mo.; N. Y.; U. S.); *Degener* 11,129, ridge north of Kaala, Mar. 26, 1937 (juvenile leaves only; Bish.; Del.; Gray; Mo.; N. Y.); *Degener, K. K. Park, & Y. Nitta* 7,137, hot, rocky valley, Keawaula Valley, Jan. 31, 1932 (Bish.; Calif. Acad.; Gray; Mo.; N. Y.; U. S.); *Degener, Park, & Topping* 9,960, arid, rocky ledge, Kuliouou Valley, June 23, 1935 (Bish.); *Degener, Park, Topping, Bush, & Northwood* 7,136, "ripe fruit dark-purplish, juicy, not sweet," gulch north of middle ridge between Puu Kamaohanui and Puu Pane, dry region, Jan. 10, 1932 (Bish.; Gray; N. Y.; U. S.; this number delineated by Nitta, see Degener, New Illustr. Fl. Haw. Isls. fam. 281, *Reynoldsia sandwicensis*, Mar. 3, 1939); *Charles N. Forbes* 1,657-*O*, 20-30 ft. tall, inflorescence of 1 or 2 terminal peduncles, bark whitish, Makua Valley, Feb. 27, 1911 (Bish.; Calif. Acad.; N. Y.; Univ. Calif.; U. S.); *F. R. Fosberg* 13,563, trunk and branches thick, fleshy, exuding yellow, oily gum when broken, fruits black when ripe, flowers yellowish, alt. 150 m., gulch bottom with *Aleurites*, small gully, northwest side of Ulumawao, Kailua, Jan. 24, 1937 (Bish.; Calif. Acad.; Chi.); *D. Wesley Garber & C. N. Forbes* 145, right fork of Wailupe Valley, Jan. 12, 1920 (Bish.); *William H. Hatheway* 3, tree 20 ft. by 24 in., in scrub on dry, rocky hillside, Wilhelmina Rise, alt. 800 ft., May 30, 1950 (Bish.); *Hatheway* 5, tree 12 ft. by 10 in., on rocky, steep, arid, west-facing slope,

alt. 650 ft., Central Ridge, Niu Valley, June 1, 1950 (Bish.); *Mann & Brigham* 607 *pro parte* (*vide etiam var. sandwicensem*), Kaala Mts. (Mo.; U. S.); *D. LeRoy Topping* 3,283, Kawaihapai, February, 1926 (Univ. Calif.); *Topping* 3,764, shrubby hillside, Kuliouou Valley, Aug. 5, 1934 (N. Y.).

While all too close to and apparently inseparable from the var. *sandwicensis* in flowers and fruits,* this variety has a foliolar dentation more as in the var. *molokaiensis* and in such species as *R. Degeneri* and *R. venusta (vide infra)*, whence the varietal epithet. Juvenile leaves (*e.g., Degener* 11,129) may measure 6 dm. or more long and 4 dm. or more broad with leaflets that have blades ±2 dm. long and ±14 cm. broad, their base often deeply cordate, their margins sharply serrate, the principal teeth often cut into 2 or more smaller teeth.

Reynoldsia sandwicensis molokaiensis var. nov. — A specie ipsa fructibus (floribus non visis) paucioribus 3-5 (interdum usque ad 8) pro ramulo quoque inflorescentiae, pedicellis 3-5 (raro usque ad 8) mm. longis differt.—Specimens examined: *Joseph F. Rock,* Kamolo, Isl. Molokai, March, 1909 (type, Gray, my photograph no. 4,158); *Rock,* Mauna Loa [at Mahana, *vide infra sub R. Degeneri*], Isl. Molokai, 1910 (Arn.).

2. **Reynoldsia Hillebrandii** sp. nov. — Arbor habitu *R. sandwicensi* sine dubio similis, ramulis siccis ad apicem dense albideque stellato-pubescentibus alibi glabris rugosis atro-griseis usque albido-griseis. Folia impari-pinnata, ±3 dm. longa petiolo 5-6 (-8) cm. longo basi stellato-pubescenti alibi glabro incluso; foliolis 7 vel 9, petiolulo tenui 7-30 mm. longo, lamina cordata vel rotundo-ovata usque deltoideo-ovata, apice obtuso retusa, basi truncata vel subcordata, utroque latere tenuissime marginata et obsolete vel humiliter repando- usque sinuato-crenata dentibus saepius 3-7, glabra, forsitan crassiuscula, 5-12 cm. longa et 4-8.5 cm. lata; rhachi tenui, glabra, ±4-5 cm. longa. Inflorescentia (unica visa, haec cum fructibus) demum circ. 2 dm. longa et 1.5 dm. lata, rhachi glabrata (ad medium ±4 mm. crassa) demum brunneo-rubra ±1.4 dm. longa regulariter (fere usque ad basim) racemoseque ramosa; ramis (28 pro typo) demum rubido-brunneis 5-7 cm. longis 1-1.5 mm. crassis inferioribus subdemissis aliis hori-

*Geographically, the two varieties overlap in range, *e.g.*, at Kawaihapai in northwesternmost Oahu and the Wailupe Valley area in southeasternmost Oahu.

zontalibus usque suberectis (nullis bracteis ad basim visis), ad supraque medium fructiferis. Drupae 10-25 pro unico ramo, racemose dispositae vel multae in umbellula terminali congregatae tenuiter pedicellatae (pedicello glabrato, 4.5-7 mm. longo, basi bracteola lanceoleto-subulata aegre hispidula subtento), demum (exsiccatae) depresso-globosae, 6-8 mm. latae, extus 8- vel 10-costatae, apice calicis limbo angustissimo subbrunneo coronatae alibi atrobrunneae usque moderate griseo-brunneae, stigmatibus in stylopodio late depresso-conico circ. 1 mm. alto latis.—Specimens examined: *William Hillebrand* 263 *pro parte,* Kau, Isl. Hawaii, *commun.* July, 1865 (Kew, 2 sheets, where commixed with Oahu material of *R. sandwicensis*); *Joseph F. Rock* 10,022, alt. 1,800 ft., Kapua, South Kona, Isl. Hawaii, January, 1912 (type, Gray, my photograph no. 4,161).

This is the species illustrated by Rock in his plates 140 and 141 (Indig. Trees Haw. Isls. 1913) for *Reynoldsia sandwicensis.* On one of the Hillebrand sheets at Kew, both Oahu material of *R. sandwicensis* and Hawaii material of the present species had been mounted. A small fragment (about 1 dm. long) of an inflorescence of the latter is present, showing some two dozen florets almost at anthesis. The reddish-brown or even brownish-red tinge on the lateral branches is at once distinctive. The flowers are much as in *R. sandwicensis* but about a third larger.

3. **Reynoldsia huehuensis** sp. nov.—Arbor, ramulis apicem versus minutissime denseque stellato-puberulis. Folia 2.5-3 dm. longa, crassiuscula, glabra, petiolo 7-9 cm. longo, petiolulis tenuibus 2-3.5 cm. longis; foliolis (pro 2 foliis visis) 9, lamina cordata usque ovata, apice obtuso integra vel retusa, basi truncata usque cordata, utroque latere tenuissime flavido-marginata et subintegra usque sinuata cum 1-3 dentibus plus minusve obsoletis et saepe ad glandulum minimum reductis, 6-11 cm. longa et 4.5-7.5 cm. lata; rhachi crassiuscula, internodiis 2.5-4.5 cm. longis. Inflorescentia (unica florescens et unica pars frutificans visae) maxima, ±3.3 dm. longa et ±2.5 dm. lata, rhachi ±2.5 dm. longa, sicca viridi-brunnea, fere usque ad basim racemose ±19-ramosa, ramis (paucis saltem interdum in rudimenta viridia graminiformia angustissima 4-7 cm. longa et sub 2 mm. lata apice scariosa fibrescentiaque sub apice sterilia vel unifloscula transformatis) usque ad 10.5 cm. longis, tenuibus (medium versus 1-2 mm.

crassis), saepius horizontalibus, siccis atro-brunneis vel atro-viridibus, summis (pro typo 3 cum 2 rudimentariis) umbellate congregatis; bractea basali fugacia, non visa. Flosculi saepius 14-24 pro unico ramo, de apice usque ad vel ultra rami medium dispositi, irregulariter racemosi vel 3-10 terminales umbellate congregati; pedicello tenui (5-) 7-13 mm. longo, sicco atro-viridi usque atro-brunneo; calice ad anthesin laevi 3-4 mm. lato longoque; petalis vix 6 mm. longis. Drupae 10-costatae, depresso-globosae, circ. 6 mm. altae (stylopodio depresso-conico sub 1 mm. alto incluso) et 7 mm. crassae.—Specimens examined: *Lucy M. Cranwell, Olof H. Selling, & Carl Skottsberg* 3,206, on lava fields, vicinity of Huehue, northwestern Hawaii, Sept. 11, 1938 (type, Goth., my photograph no. 4,167).

Reynoldsia huehuensis intermedia var. nov.—Foliola certius crenato-serrata (basi raro lobata vel infima etiam bipartita subpetiolulis tenuibus ±1.5 cm. longis) dentibus acriusculis circ. 2-7 pro utroque latere. Petala 7-8 mm. longa; pedicellis ad anthesin tenuibus 3-4.5 mm. longis; drupis non visis.—Specimens examined: *Alfred Meebold,* alt. 3,000 ft., Puuwaawaa, Isl. Hawaii, May, 1932 (Bish.); *Carl Skottsberg* 679, alt. 660 m., Puuwaawaa, Hawaii, Sept. 26, 1922 (type, Goth., my photograph no. 4,166).

Reynoldsia huehuensis brevipes var. nov. — Foliola minora sub 7 cm. longa lataque. Inflorescentiae nunc solitariae laterales cum ±19 ramis nunc duae terminales cum ±7-10 ramis; rhachi 6-11 cm. longa; ramis robustioribus, 3-5 cm. longis et 1.5-2.5 mm. crassis, 4-9 ad rhachis cacumen umbellulate congregatis, flosculis confertioribus fere sessilibus pedicello circ. 1-2 mm. longo. Drupae ignotae.—Specimens examined: *Otto Degener* 7,128, arid region between Puuwaawaa and Huehue, northwestern Hawaii, Aug. 22, 1926 (type, N. Y., my photograph no. 4,159; isotypes, Bish.; Calif. Acad.; Gray, my photograph no. 4,160; Mo.).

4. **Reynoldsia venusta** sp. nov. — Arbor ramulis siccis rugosis apice dense stellato-puberulis alibi glabratis subbrunneo-griseisque. Folia impari-pinnata, petiolo tenui basi dilatato stellato-pubescentique circ. 6-9.5 cm. longo, foliolis (pro 8 foliis visis) 5-9, teneris, ovato-lanceolatis usque ovatis, apice acuminatis, basi truncatis usque rotundatis raris-

simeque subobliquis, utroque latere (tenuissime marginato) antrorsum 4-10 dentibus inflexis crenato-serratis, 4-9 cm. longis et 2.5-5.5 cm. latis, petiolulo tenui glabrato 1.5-3 cm. longo, rhachi tenui glabrataque internodiis 3-6 cm. longis. Inflorescentia elongata, 1.5-3.5 dm. longa (pedunculo valde cicatricato basim versus stellato-puberulo 3-6 mm. crasso et usque ad 14.5 cm. longo incluso); rhachi sparsim stellato-peberula, demum siccescente rubido-brunnea; ramis tenuibus, saepius 3.5-5.5 cm. longis, glabris vel basim versus stellato-pubescentibus, racemo-dispositis (bractea basali caduca), antrorsum arcuatis usque suberectis subpatentibusve, ad propeque apices tantum 4-9-flosculatis. Flusculi parvi, tenuiter, pedicellati (pedicello usque ad 9 mm. longo, bracteola minima conspicue albo-pubescenti caduca); calice turbinato-urceolato, glabrato, apice truncato, ad anthesin tantum 2 mm. lato et 2.5 mm. alto; petalis 10, linearibus, irregulariter cohaerentibus, circ. 6 mm. longis, supra medium patentibus, filamentis circ. 2 mm. antheris circ. 1 mm. longis. Drupae maturae siccae rubido-brunneae, depresso-globosae, glabratae, plerumque 7- (rarius 6- vel 8- rarissime 10-) costatae, stylopodio late conico basi circ. 1.7-2.1 mm. lato vix 1 mm. alto, corpore 4.5-5.5 mm. crasso paulo breviore. — Specimens examined: *Joseph F. Rock,* Makaleha Valley, Mokuleia, northwestern Oahu (type, Arn., my photograph no. 4,154; isotypes, Bish.; N. Y., my photograph no. 4,153).

Of the 29 drupes preserved in a packet on the sheet at Bishop Museum, *22 were definitely 7-costate,* 4 were 6-costate, 2 were 8-costate, and only one was 10-costate.

Reynoldsia venusta lanaiensis var. nov.—Folia (tantum 2 visa) nunc 5- nunc 7-foliolata, foliolis plus minusve cordatis, apice obtusis usque brevi-acuminatis, lamina usque ad 13 cm. longa et 11 cm. lata. Inflorescentiae rami (39 pro typo in rhachi 1.5 dm. longa) subrecti, inferiores medianiaque divaricati, bractea basali subtendente lineari-filiformi pubescenti saltem in anthesin saepe persistente; bracteolis minimis subfiliformibus sparsim pubescentibus saepe in anthesin persistentibus. Calyx dimidio longior latiorque; multis corollis submaturis sed nondum apertis tenuibus circ. 5.5 mm. longis et 1.5 mm. crassis, paucis ad anthesin, filamentis tenuissimis 4-5 mm. longis, antheris gracilibus fere 3 mm. longis. Drupae non visae.—Specimens examined: *George C. Munro* 30, native name "ohe kukuluaeo," Kaa, eastern Lanai, Oct. 16, 1913 (type, Bish., my photograph no. 4,169).

5. **Reynoldsia Degeneri** sp. nov.—Arbor habitu *R. sandwicensi* sine dubio similis, ramulis albido-griseis (exsiccatis rugosis) glabris vel apice ipso dense stellato-pubescentibus. Folia impari-pinnata (exsiccata viridi-brunnea), petiolo tenui glabro vel basim dilatatam versus stellato-pubescenti plerumque 4.5-6 cm. longo, foliolis plerumque 7 vel 9, petiolulo tenui 5-25 mm. longo basi stellato-pubescenti alibi glabrescenti, lamina membranacea ovata usque ovato-subdeltoidea apice obtusa usque subacuta subacuminatave, basi truncata subcordatave saepe valde obliqua, utroque latere angustissime marginata et subirregulariter serrata crenatave (dentibus antrorsis inflexis, latere superiore circ. 1-3 mm. longis), plerumque 4-7.5 cm. longa et 3.5-6 cm. lata; rhachi tenuissima, glabra, internodiis circ. 2.5-4 cm. longis. Inflorescentia terminalis vel subterminalis, sparsissime stellato-pubescens, rhachi 6-8 (etiam -14) cm. longa pedunculo nunc longo nunc brevi incluso, ramis (20-30) tenuissimis 2-5 cm. longis plus minusve flexis inferioribus medianisque patentibus superioribus suberectis, basi bractea lineari 2-4 mm. longa subtentis, ad propeque apicem circ. 10-20-flosculatis. Flusculi parvi, tenuissime pedicellati (pedicello usque ad 7 mm. longo, basi bracteola minima sub 1 mm. longa subulata usque oblonga plus minusve pubescenti et conspicue ciliata plerumque persistente subtento), terminales (circ. 4-14) in umbellula congregati; calice obconico, apice truncato ad anthesin tantum circ. 1.5-2 mm. lato et sub 1.5 mm. alto; corolla (nondum complete aperta) tantum 3 mm. alta. Drupae non visae.—Specimens examined: *Otto Degener* 7,132, arid region, on East Ohia Ridge, far southeastern Molokai, Jul. 17, 1928 (type, Gray, my photograph no. 4,157: isotypes, Calif. Acad.; Mo.; N. Y.; U.S.).*

Reynoldsia on Molokai was known to Hillebrand (*cf.* Fl. Haw. Isls. 156: "*R. sandwicensis* . . . on all islands"), to Rock, and to others. Indeed, Rock (Indig. Trees Haw. Isls. 351. 1913) wrote: "Molokai, where it can be found at the western end at Mahana in gulches, and on the heights above Kamolo."

*Degener's labels all read: "On East Ohia ridge, Kaunakakai," but "Kaunakakai" is clearly an error (assuming that July 17, 1928, is correct). From Degener's invaluable "Rosetta Stone," a key prepared by him some years ago to summarize his collection data and deposited in my keeping, it is seen that he visited Kaunakakai July 10, 1928, and left the same day. July 13, he went "along road in vicinity of Pukoo." July 16, the next collecting date, he went "up valley west of East Ohia." July 17, he was "on East Ohia Ridge." The next collecting date, July 20, he spent in the "western branches of Mapulehu Valley." Our type collection may be safely attributed, therefore, to the East Ohia Ridge, some 17 or 18 km. east of Kaunakakai.

Rock's material from both cited localities is the above described *R. sandwicensis* var *molokaiensis*. All other Molokai material examined thus far lacks mature fruits and, except for *Degener* 7,132, inflorescences with buds or flowers. *Degener* 7,132 is so unique in its inflorescences, however, that it is seen to constitute a very distinct species. It is a pleasure to associate with this species the name of Mr. Degener, whose vast collections and intensive studies of Hawaiian plants entitle him at once to front rank among the abler students of the Hawaiian flora.

6. **Reynoldsia mauiensis** sp. nov. — Arbor ramulis siccis rugosis albidis usque flavido-griseis cacumine dense stellato-pubescentibus alibi glabratis in herbario 1-2 cm. crassis. Folia usque ad ±3.5 dm. longa et ±2 dm. lata, impari-pinnata; petiolo tenui usque ad 9.5 cm. longo, basi dilatato dense stellato-puberulo alibi glabro; foliolis 5-9, glabris, petiolulo 1.5-3.4 cm. longo; lamina cordata usque oblongo-ovata vel late oblongo-lanceolata, membranacea, apice acuminata usque obtusa et paulum retusa, basi saepe obliqua nunc truncata vel latissime rotundata nunc subcordata, utroque latere certe vel subobsolete subsinuateve crenata (dentibus 3-8), 5-9 cm. longa et 4-7 cm. lata; rhachi tenui glabra vel nodis minutissime stellato-pubescenti internodiis sub 6.5 cm. longis. Inflorescentia terminalis vel paulum subterminalis, conspicua, mox usque ad 2 dm. lata interdum aequaliter alta, rhachi robusta (infra interdum 7-10 mm. crassa), usque ad 1.3 dm. longa, glabrata, exsiccata brunnea usque atra; ramis 14-25, racemose regulariterque (fere usque ad basim) dispositis vel 4-7 terminalibus umbellate congregatis, paucis suberectis aliis antrorsum retrorsumve arcuatis, siccis plus minusve rubido-brunneis, usque ad 8 etiam 9 cm. longis, basim versus nudis alibi fructiferis (flosculis non visis) bracteis subtendentibus fugaciis. Pedicelli tenui, glabri, recti vel paulum arcuati, plerumque 8-12 mm. longi, 3-9 ad rami apicem umbellate congregati alii racemose dispositi et patentes divaricative bracteolis subtendentibus minimis linearibus fugaciis. Drupae maturae ignotae; valde immaturae exsiccatae plus minusve ovoideae et 6-8-costatae; calice urceolato-globoso, intense atro (limbo apicali brunneo excepto), glaberrimo vel ex minima parte albo- et stellato-puberulo, circ. 3-4 mm. alto et paulo angustiore; stylopodio conspicuo, conico, 1.6-2 mm. alto et basi circ. 3 mm. crasso, nunc glabrato nunc sparsim adpresso-setoso; stigmati-

bus aegre setulosis.—Specimens examined: *Charles N. Forbes* 1,921-*M*, on very rough lava flow with scattered trees, Nuu, south slope of Haleakala, East Maui, Mar. 9, 1920 (Bish.; N. Y.); *Joseph F. Rock* 8,664, Auwahi, southernmost East Maui, November, 1910 (type, Gray, my photograph no. 4,164: isotypes, Arn., 2 sheets, my photograph no. 4,165; Bish.; Calif. Acad.; N. Y.; Univ. Calif.; U. S.); *Rock*, Kahikinui, southernmost East Maui, November, 1910 (topotype, N. Y.);* *E. C. Zimmerman*, tree 15 ft. tall, barren lands, alt. 1,400 ft., Ulupalakua-Kaupo Road, vicinity of Alena, East Maui, November, 1948 (Bish.).

7. **Reynoldsia oblonga** Degener & Sherff, sp. nov.—Arbor habitu sine dubio *R. sandwicensi* similis, unico ramulo sicco atro-griseo circ. 2 cm. crasso minutissime sed irregulariter stellato-pubescenti cum 4 foliis viso. Folia impari-pinnata 1.8-2.5 dm. longa (petiolo tenui 4-7 cm. longo glabrato basi dilatato et circ. 6 mm. lato incluso); foliolis nunc 9 nunc 11, petiolulo glabro tenui 6-13 mm. longo, lamina oblonga vel ovali-oblonga (rarius lanceolato-oblonga), glabra, apice obtusa et plus minusve retusa, basi late rotundata usque truncata et interdum obliqua, lateribus tenuissime marginata et aegre crenata (dentulis pro unico latere circ. 5-10, antrorsis, inflexis, interdum subobsoletis), plerumque 5-5.5 cm. longa et 2.5-3.5 cm. lata; rhachi tenui glabra internodiis 1.3-4.3 cm. longis. Unica inflorescentia immatura probabiliter abortiva visa, haec circ. 3 cm. longa, ex auctu vetere orta; ramulis ±18, ad apices umbellulate circ. 12-14-fluosculatis. Drupae ignotae.—Specimens examined: *Otto Degener* 17,789, tree-covered *aa* lava *kipuka* half-way between Kaalualu and Waiohinu, southernmost Hawaii, Sept. 10, 1929 (type, N. Y., my photograph no. 4,162).

The type had been sent out by Mr. Degener as *Reynoldsia sandwicensis*, but the more or less oblong leaflets distinguish the material at once from that species, and in fact all other Hawaiian species. A full description must await, unfortunately, future collections in the type locality. A packet on the type sheet contains five leaflets of a more or less cordate pattern

*A single sheet has been seen (Bish.) of *Rock* "8,664*a*" labeled as from Mahana, Molokai, March, 1910. The eleven drupes preserved in the packet are 6-pyrenate and identify the two leaves on the sheet as belonging to *R. mauiensis*, not otherwise known from Molokai. From Rock's use of the no. 8,664*a*, (*cf.* 8,664 *supra pro plantis mauiensibus*) it seems likely that the real habitat was on Maui, not Molokai.

and a fragment of an immature, densely yellowish-pubescent inflorescence, all of which obviously belonged to other specimens and so have been excluded from the Latin description.

8. **Reynoldsia Hosakana** sp. nov.—Arbor ±9 m. alta, ramulo ad apicem stellato-puberulo alibi glabrato sed rugoso, subgriseo. Folia (unicum visum) ±4 dm. longa, impari-pinnata, ±9-foliolata; petiolo basi dilatato stellato-puberulo alibi glabro, ±12 cm. longo; foliolis teneris, lamina ovata usque cordato-ovata, usque ad 11.5 cm. longa et 7.5 cm. lata, glabrata, apice obtusa usque subacuminata, basi truncata usque cordata et non obliqua, utroque latere 5-8 dentibus (his subcertis antrorsis parvisque) crenulata; petiolulo tenui usque ad 2.5 cm. longo, basi stellato-pubescenti alibi glabro; rhachi tenui, internodiis 5.5-8.5 cm. longis. Inflorescentia (unica visa) subterminalis, ±2.7 dm. longa et sub 8 cm. lata, sparsim usque dense conspicueque albido-stellato-pubescens, rhachi tenuissima (circ. 2.5 mm. crassa) usque ad basim lateraliter ramosa; ramis ±23, tenuissimis (circ. 0.5-0.7 mm. crassis), 2-4 cm. longis, imis horizontalibus et bractea late ovata glabrescenti circ. 2 mm. longa subtentis, aliis (saltem ad anthesin) suberectis, bractea basali deficiente. Flosculi minimi, sine odore, pauci (circ. 5-8) ad rami apicem umbellulate congregati alii racemose dispositi; pedicello filiformi 2-3.5 mm. longo supra plus minusve glaberrimo infra (praecipue ad basim) valde albo-hispido; calice infundibuliformi limbo lacerato albo-hispido alibi plerumque glaberrimo tantum circ. 0.6 mm. alto et circ. 1.5 mm. lato; corolla circ. 3 mm. alta, petalis primum leviter flavis usque flavido-viridibus, siccis brunneo-flavis oblongo-linearibus irregulariter cohaerentibus. Drupae ignotae.—Specimens examined: *Edward Yataro Hosaka* 1,334, tree 30 ft. tall, on wooded gully slope, alt. 1,300 ft., Haili Gulch, Kaena, Isl. Oahu, Feb. 2, 1936 (type, Bish., my photograph no. 4,168).

The elongate, very narrow and conspicuously (but irregularly) white-pubescent inflorescence, the diminutive florets and filiform pedicels, and the broad bracts subtending at least the lower branches of the inflorescence (the bracts for the median and upper branches are missing on the type), all are very distinctive.

Mr. Hosaka, in honor of whom this species is gratefully named, revisited the type locality on March 2nd of this year, at my solicitation. He reports finding a "very few scattered

trees," from which he obtained "many sheets of young fruiting specimens" (his no. 3,651).

Chicago Natural History Museum, Chicago, Illinois.

III. Additions to our knowledge of the genus Tetraplasandra A. Gray (fam. Araliaceae)

By Earl Edward Sherff

Tetraplasandra Lydgatei (Hillebr.) Harms in Engl. & Prantl Pflanzenfam. III, 8: 20. 1898; *Triplasandra Lydgatei* Hillebr. Fl. Haw. Isls. 153. 1888.—This species was founded by Hillebrand upon a plant by Lydgate from Wailupe, southeasternmost Oahu. The type was in the Berlin Herbarium and perished with the destruction of that herbarium in the recent world war. I have before me, however, a sheet from the Bishop Museum Herbarium, bearing a 7-foliolate leaf and a single peduncle about 6.5 cm. long, with seven pedicellate fruits still attached. These were from Lydgate's own herbarium and are authentic for the species. The original label gives "Niu or Wailupe" but presumably Hillebrand, who collected jointly with Lydgate many of the specimens that went into Lydgate's herbarium, had definite knowledge that Wailupe was the real locality. The pedicels are slender and 13-16 mm. long. Hillebrand (*loc. cit.*) gave the length as 16-18 mm. ("8-9 lines"). The species in its narrower sense seems to have been collected only once again (*Forbes* 2,511-*O*, Wailupe Valley). Four hitherto undescribed varieties, all of them exceedingly rare, may be recognized, however, from herbarium specimens available in more recent years. These follow:

Tetraplasandra Lydgatei brachypoda var. nov.—Pedunculi normaliter 4-6, circ. 3.5-5.5 cm. longi et 1-1.5 mm. crassi, usque ad circ. 18-20-flori, pedicellis tenuibus demum 8-10 mm. longis; drupis siccis 5-6 mm. crassis altisque paucis 4-angulatis aliis 3-angulatis.—Specimens examined: *Otto Degener* 18,244, moderately dry open forest, western slope of central ridge of Niu Valley, Isl. Oahu, June 4, 1932 (topotypes, Mo.; N. Y.); *Degener, Park, & Nitta* 6,009, in moderately dry open woods on side of trail on western slope of central ridge of Niu Valley, Isl. Oahu, June 4, 1932 (topotypes, Gray; N. Y.; U. S.); *Charles N. Forbes with J. C. Bridwell* 2,461-*O*, ridge

between Niu and Wailupe, Isl. Oahu, Apr. 11, 1917 (Bish.); *D. LeRoy Topping & Will Bush* 3,701, tree 30-40 ft. tall, same one as for *Degener et al.* 6,099, Dec. 3, 1933 (type, N. Y., my photograph no. 4,185: isotypes, Mo.; N. Y., 2 sheets; U. S., my photograph no. 4,189).

The foliage of dried specimens is notably pallid and is often 11- or 13-foliolate. Degener (Fl. Haw. fam. 281. June 29, 1934) has presented a beautiful plate of this variety, drawn from one of the *Topping & Bush* specimens. With him, however, it was assumed to represent *T. Lydgatei* proper.

Tetraplasandra Lydgatei Forbesii var. nov.—Arbor ±6 m. alta, cortice subatro, foliis 7-foliolatis. Pedunculi ±13 umbellate positi, 9.5-12 cm. longi et 1.5-3 mm. crassi, siccescentes rubido-brunnei, 20-30-flori; pedicellis tenerrimis plerumque 15-22 mm. longis; drupis ovoideo-globosis, acriter 3- vel saepissime 4-angulatis, 4-6 mm. crassis et stylopodio stigmatibusque inclusis 8 mm. altis.—Specimens examined: *Charles N. Forbes* 1,942-*O*, tree about 20 ft. tall, darkish bark, leaves with 7 leaflets... leaves turning yellow with age... ridge west of Waialae Valley, near the top, rather dry locality, Isl. Oahu, Oct. 15, 1914 (type, U. S., my photograph no. 4,187: isotype, Bish., a mere fragment, but with fuller data); *L. H. Mac Daniels* 466, Palolo-Waialae Ridge, Oahu, Jan. 27, 1927 (topotype, Bish.).

The elongate, numerous peduncles and pedicels at once distinguish this variety.

Tetraplasandra Lydgatei leptorhachis Degener & Sherff var. nov.—Foliola 5 vel 7. Inflorescentia umbella decomposita in rhachi circ. 3-4 mm. crassa et 1.5-2.5 cm. longa elata; pedunculis 4-8, siccescentibus viridi-brunneis, 4-7.5 cm. longis et circ. 2 mm. crassis, 18-32-floris; pedicellis tenuibus, 12-16 mm. longis, siccis viridi-brunneis; drupis ovoideis, acriter 3- vel 4-angulatis, submaturis 4-5 mm. crassis et 6-7 mm. altis.—Specimens examined: *Otto Degener,* slope northeast of Nuuanu Valley, Isl. Oahu, Nov. 20, 1926 (topotype or perhaps isotype, N. Y.); *Degener,* Wahiawa, Oahu, Nov. 25, 1926 (N. Y., my photograph no. 4,191); *Degener* 17,796, open, windy rainforest, slope northeast of Nuuanu Valley, Oahu, Nov. 20, 1926 (type, U. S., my photograph no. 4,190: isotypes, Mo.; N. Y.).

In *T. Lydgatei* proper (*i.e.*, var. *Lydgatei*), also in the vars.

brachypoda and *Forbesii*, the flowering axis is reduced to a short, thick stump 1 cm. or so long, a mere anchorage for the rays of the compound umbel. In var. *leptorhachis* the rhachis stands out distinctly as a slender stalk.

The geographic range is remarkable, extending as it does northwestwardly from Nuuanu Valley in far southeastern Oahu to Wahiawa, well past the center of Oahu. Recourse to my private copy of Degener's "Rosetta Stone" (*vide supra*, p. 15, footnote), shows that on the date given for Wahiawa, Mr. Degener collected "in the mountains east of Wahiawa."

Tetraplasandra Lydgatei coriacea var. nov.—Foliola 5-9, elliptico-oblonga, 8-12 cm. longa et 3.5-5.7 cm. lata, superne nitida coriaceaque. Pedunculi inflorescentiae immaturae ±10, circ. 3-3.5 cm. longi, ad medium bractea late ovata acriter acuminata ±3 mm. longa demum decidua vestiti, umbellate supra rhachin crassam circ. 1 cm. longam congregati, ±35-flori; pedicellis tenuibus circ. 6 mm. longis, calice circ. 1.5-2 mm. alto, corolla immatura adhuc clausa extus acriter hexagona circ. 3.2 mm. alta et circ. 2.5 mm. crassa.—Specimens examined: *Richard S. Cowan* 563, alt. 1,800 ft., Halawa Valley Ridge Trail, Koolau Range, southeastern Oahu, Mar. 2, 1947 (type, Bish., my photograph no. 4,192).

The glossy, leathery upper surface of the leaves is very distinctive. The packet on the type sheet contains three more or less mature drupes, but there is nothing to indicate that they actually came from the type tree. Their pedicels are 8 mm. long, two are 3- and one is 4-gonous, and all are about 1 cm. tall, stylopodium and stigmas included.

The five varieties of *T. Lydgatei* now known (including the var. *Lydgatei*) may be separated according to the following key:

a. Leaflets glossy and leathery on upper surface.
var. *coriacea.*

a. Leaflets otherwise.

b. Inflorescence sessile or subsessile, its thick, scarcely visible footstalk ±1 cm. tall.

c. Peduncles ±13 (in herbarium specimens some may have been cut away), about 9.5-12 cm. long and 1.5-3 mm. thick, 20-30-flowered, pedicels 15-22 mm. long.
var. *Forbesii.*

c. Peduncles about 4-6, only 3.5—6.5 cm. long, more slender, 10-20-flowered.

d. Peduncles up to about 18-20-flowered, pedicels finally 8-10 mm. long; drupes 5-6 mm. tall and thick, mostly 3-angled.....var. *brachypoda.*

d. Peduncles about 12-flowered, pedicels finally 13-18 mm. long; drupes ovoid-globose, 8-10 mm. thick and somewhat taller, obtusely 4-angled.

var. *Lydgatei.*

b. Inflorescence on a definite slenderish footstalk 1.5-2.5 cm. tall .....var. *leptorhachis.*

Tetraplasandra waialealae Rock, Coll. Haw. Publ. Bull. no. 1: 10, pl. 1. 1911.—This species was founded upon mixed material, *Rock* 4,902 and *Rock* 8,870. The first cited habitat, however, was "Summit of Waialealae, elevation 5,000 ft.," and this may be taken as limiting the species in its narrower sense to *Rock* 8,870, the tree with leaflets obtuse but mostly very short- or abrupt-acuminate tips. Indeed, Rock's full-page plate is of that form. Excellent specimens of *Rock* 8,870 are in certain herbaria (Arn., 2 sheets; Bish., my photograph no. 4,201; Gray, 3 sheets) and on some of their labels the tree is said to be "abundant on summit of Waialealae."

Rock 4,902 is seen to consist of two forms, both of them different from var. *waialealae* (*i.e.*, the species proper) in having apically sharp-attenuate and -acuminate leaflets, and one of them, from Kaluiti Stream, with urceolate (not cylindric) fruiting-calyces. These and several others, all of which have been labeled indiscriminately *T. waialealae* in herbaria heretofore, are described below:

Tetraplasandra waialealae acrior var. nov. — Foliola 5-7, oblonga vel interdum paulum ovata vel minime obovata, apicem versus angustata et acerrime acuminata, lamina 8×13 cm. usque ad 18×7 cm. Drupae submaturae cylindrico-prismaticae 1.5-2 cm. altae stylopodio conico incluso, stigmatibus 5 vel 6.—Specimens examined: *Albert S. Hitchcock* 15,481, alt. 3,600-5,080 ft., Waialealae, Isl. Kauai, Oct. 22-24, 1916 (U. S., my photograph no. 4,206); *Joseph F. Rock*, Isl. Kauai, October, 1916 (Bish., my photograph no. 4,205); *Rock* 4,901, near summit of Waialealae, Isl. Kauai, Sept. 22, 1909 (Arn.); *Rock* 4,902 *pro parte*, Kailiili Stream, Keaku Cave, Isl. Kauai, September, 1909 (type, Gray, my photograph no. 4,202).

Tetraplasandra waialealae urceolata var. nov.—Folia ±9-foliolata, ±4.5 dm. longa, petiolo ±1.5 dm. longo basim versus ciliato minutissime numerosissimeque papillato et sparism puberulo; foliolis anguste oblongis vel imis oblongo-ovatis, apice acriter subsensimque acuminatis, basi latissime et interdum inaequaliter cuneatis, lamina 11-15 cm. longa et 3.5-5.5 cm. lata, petiolulo 4-16 mm. longo. Drupae submaturae urceolatae circ. 16-17 mm. altae stylopodio stigmatibusque inclusis et sub medio ±1 cm. latae.—Specimens examined: *Joseph F. Rock* 4,902 *pro parte,* Kaluiti Stream, high plateau, alt. 4,800 ft., central Kauai, Sept. 22, 1909 (type, Bish., my photograph no. 4,203).

The leaflets are more gradually attenuate toward their tip than in var. *acrior* and the submature drupes, of which four are preserved on the type sheet, are thick-urceolate (more as in *T. waimeae* Wawra), not cylindric-prismatic as in that variety. Rock (*loc. cit.*, also Indig. Trees Haw. Isls. 343. 1913) did not attempt delimitation of these varieties *urceolata* and *acrior* from *T. waialealae* proper, having collected them all within a distance of about 3 km. from each other. Study of a topographic map reveals, however, that the three habitats involved differ sharply in conditions of altitude, drainage, etc. (Regarding the whole subject of ecological barriers, some of which unquestionably exist between the three type habitats, see Riley, The American Naturalist 86: no. 826: 23. 1952.)

Tetraplasandra waialealae subsessilis var. nov.—Folia 3-4.5 dm. longa, 11- vel 13- (raro 15-) foliolata; petiolo robusto 6-9 cm. longo; foliolis anguste usque moderate oblongis, apice (siccis plerumque flexis) subacuminatis raro obtusis, basi obliquis, coriaceis, sessilibus usque breviter petiolulatis, petiolulis 1-10 mm. longis, lamina 8-13 cm. longa et 3.5-5 cm. lata. Pedunculi 9-13 cm. longi, robusta; ramis secundariis nunc (pro typi numero) 3 vel 4 nunc ±8, rectis arcuatisve, 4-7 cm. longis; pedicellis 3-6, nunc (pro typi numero) omnibus subrectis nunc nonnullis arcuatis, 0.8-2 cm. longis.—Specimens examined: *Lucy May Cranwell, Olof H. Selling, & Carl Skottsberg* 2,925, forests in the vicinity of Lehua makanoi, Alakai, Isl. Kauai, Aug. 13, 1938 (type, Bish., my photograph no. 4,197: isotype, Goth., my photograph no. 4,200); *Otto Degener & Henry Wiebke* 2,183, sunny, open swamp, Waineke Swamp, Kokee, Kauai, June 28, 1926 (N. Y., 2 sheets, my photograph no. 4,199); *Fagerlind & Skottsberg* 6,587, near

Kawaikinana Stream, Kokee-Mohihi Road, Kauai, Mar. 13, 1948 (Stockh.); *L. H. MacDaniels* 811, slender tree 4 m. tall, swampy ground in mixed forest, Alakai Swamp, alt. 1,300 m., Kauai, Feb. 17, 1927 (Bish.).

Skottsberg (Meddel. Göteborgs Bot. Trädg. 15: 415. 1944) has given a special description of *Cranwell et al.* 2,925, but referred it to the species proper. He apparently overlooked the subsessile and coriaceous nature of the leaflets, which he did note, however, as being "11-13 instead of 5-9."

Tetraplasandra waialealae wahiawensis var. nov. — Arbor pumila. Folia submembranacea, 2-3 dm. longa, 7-11-foliolata, petiolo 5-8 cm. longo; foliolis ovatis usque oblongis, apice subacuminatis vel subacutis usque obtusis, basi obliqua latissime cuneatis, lamina 5.5-9 cm. longa et 2.5-5 cm. lata; petiolulis nunc (pro typo) 2-9 mm. nunc 1.2-2.6 cm. longis. Inflorescentiae rami primarii ±3, demum robusti, ±9 cm. longi et 7-9 mm. crassi; secundarii (pedunculi) ±9, demum robusti, circ. 4.5-6.5 cm. longi et sub 4 mm. crassi; pedicellis circ. 3-5 demum robustis arcuatisque 2-2.7 cm. longis et 2.5-3 mm. crassis.—Specimens examined: *Charles N. Forbes* 200-*K*, several trees, low, 4 ft. tall, flat-topped, petals 5, stamens 20, ovary 5-celled, on edge of Wahiawa Swamp, Isl. Kauai, August, 1909 (topotype, Bish.); *Forbes* 274-*K*, Wahiawa Swamp, Aug. 11, 1909 (type, Bish., my photograph no. 4,204); *Amos A. Heller* 2,734 *pro parte*, along the Hanapepe River, near the Falls, Kauai, Aug. 14, 1895 (Gray, my photograph no. 4,208); *Heller* 2,734 *pro parte*, in and near a bog at the head of Wahiawa Stream, Kauai, Aug. 21, 1895 (N. Y.; Univ. Calif.); *Heller* 2,734 *pro parte*, between the Hanapepe and Wahiawa rivers, Kauai, Aug. 24, 1895 (Mo.); *Heller* 2,734 *pro parte*, in and near a bog at the head of Wahiawa Stream, Kauai, Oct. 19, 1895 (U. S., my photograph no. 4,207); *Rev. John M. Lydgate*, Wahiawa Mts., Kauai (Bish., my photograph no. 4,198).*

Heller (Minnesota Bot. Studs. 1: 871. 1897) collected besides those specimens above cited from southern Kauai, sev-

**Forbes* 205-*K*, vicinity of Wahiawa Swamp, August, 1909 (Bish.) is a spray from a seedling. One leaf is about 2.5 dm. long; its 5 leaflets narrowly ovate to lanceolate-oblong and acute to sharply attenuate-mucronate. A second leaf is simple, its ovate-oblong blade 14 cm. long and about 7.7 cm. wide. The third is simple but the blade, about 11 cm. long, has on each side a large basal lobe 2.5-3 cm. long, giving an overall width of more than 1.1 dm. The plant is doubtless to be referred to the present var. *wahiawensis*.

eral others on Kaholuamanu, considerably northwest, where the habitats are much drier. These he distributed under the same number 2,734. All were labeled *T. waimeae* Wawra, which of course was the only species of *Tetraplasandra* known from Kauai at that time. His five specimens of the present variety have the flowering umbellets arranged very corymbosely, the elongate calyces of their flowers offering an illusory resemblance to the involucres of some species of *Tagetes* L.

Hochreutiner (Candollea 2: 481. 1925) described his *T. Elstonii* from material collected at Kaunapalanui near Gay's cottage on Kaholuamanu at 1,300-1,400 m. altitude, Apr. 19, 1905. The inflorescence was described as being pedunculate, as in *T. waialealae,* not sessile, as in *T. waimeae.* I have seen no authentic material. Hochreutiner regarded it as a species intermediate between *T. waialealae* and *T. waimeae,* next mentioned.

Tetraplasandra waimeae Wawra, Flora 56: 158. 1873. — Wawra's type came from the environs of Halemanu ("um Halemanu"), Waimea, northwestern Kauai. Hillebrand may have accompanied Wawra on the collecting trip, for his specimen at Gray Herbarium, "collected Dr. W. Hillebrand, 1871," has the species named in honor of Wawra. Moreover, the fragment, a leaflet and entire flower, at Bishop Museum, "*ex coll. Hillebrand in Herb. Berlin*" bears on the label, "Halemanu," Wawra's type locality. Had Wawra not published the binomial *Tetraplasandra waimeae* in 1873, Hillebrand's binomial honoring Wawra would doubtless have appeared in 1888, when Hillebrand's posthumous Flora of the Hawaiian Islands was published.* The following specimens, all from the **Island of Kauai,** have been examined: *Charles N. Forbes* 432, mountains in vicinity of Kaholuamanu, September, 1909 (Bish.); *Forbes* 1,064-*K,* Waimea Drainage Basin, west side, Jul. 3-Aug. 18, 1917 (Bish.); *William Hillebrand,* Waimea, 1871 (Gray, my photograph no. 4,211); *Hillebrand,* Halemanu (fragment, Bish.); *Albert S. Hitchcock* 15,550, vicinity of Kaholuamanu, Oct. 26, 1916 (U. S.); *Joseph F. Rock,* Kauai, October, 1916 (Bish.); *Rock* 1,720, Halemanu, Feb. 14-26, 1909 (topotype, Bish., foliage only); *Rock* 1,744, Kaholuamanu, Mar. 3-10, 1909 (Bish.; U. S.); *Rock* 5,162, Kaholuamanu, September, 1909 (Gray); *Rock* 5,165, same place, Sept.

*In his Flora, however, Hillebrand mentioned Wawra and Knudsen as collectors but omitted his own name.

3, 1909 (Bish., my photograph no. 4,213); *Rock* 5,167, same place, September, 1909 (Gray, my photograph no. 4,214); *Rock* 5,168, in the mountains above Waimea, in forest of Kaholuamanu near Opaiwela, alt. 3,700 ft., Sept. 3, 1909 (Arn., 2 sheets); *Rock* 5,913, Opaiwela trail, alt. 3,700 ft., Sept. 3, 1909 (Bish.); *Carl Skottsberg* 1,009, alt. about 1,200 m., near Kokee ranger station, Waimea, Oct. 28, 1922 (Goth.).

Tetraplasandra waiameae angustior var. nov.—Foliola plerumque angusto-oblonga marginibus lateralibus plerumque fere parallelis, petiolulo 4-11 mm. longo, lamina apice retusa usque rotundata obtusave basi late cuneata usque rotundata (et pro foliolis lateralibus valde obliqua), usque ad 11×3.5 cm. vel. 12×4 cm. vel 9×3.2 cm. raro 14×5 cm. Drupae maturae usque ad 1.8 cm. altae et 1.5 cm. crassae.—Specimens examined: *Amos A. Heller* 2,734 *pro parte*, in and near a bog at the head of Wahiawa Stream, Kauai, Aug. 21, 1895 (type, Phila., my photograph no. 4,209); *Heller* 2,734 *pro parte*, same habitat, Aug. 12, 1895 (Arn.); *Heller* 2,734 *pro parte*, on Kaholuamanu, Kauai, Sept. 10-16, 1895 (Bish., my photograph no. 4,210; Par., 2 sheets).

Under his no. 2,734, Heller collected two kinds of material. The first has already been treated above under *T. waialealae* var. *wahiawensis*. The second is the present var. *angustior* of *T. waimeae* Wawra. The specimen at Philadelphia has been selected as the type, since it bears a fine inflorescence in the mature-fruit stage. The inflorescence is essentially sessile as in *T. waimeae*, not stalked as in *T. waialealae*.

Heller, it will be noted above, gave two habitats, one, Kaholuamanu, and the other, at or near what is often called Wahiawa Swamp. Since the variety is so extremely rare as never to have been collected apparently by anyone else, it seems incredible that he found it in both of the widely separated habitats mentioned. In a number of other cases I have found Heller's specimens to have been distributed with "crossed labels." Since we *know* that one form under his no. 2,734, namely *T. waialealae* var. *wahiawensis*, does grow at and near Wahiawa Swamp, it seems probable that his other form, the present *T. waimeae* var. *angustior*, came from somewhere on Kaholuamanu.

Tetraplasandra bisattenuata sp. nov.—Folia 5- vel 7-foliolata, ± 2-2.5 dm. longa; petiolo 6-7 cm. longo; foliolis circum-

ambitu fusiformibus, lamina utrinque attenuata aliter oblonga tantum 6-9 cm. longa et 2.5-4.5 cm. lata, petiolulo longiore usque ad 3.5 cm. longo. Inflorescentia *Tetraplasandrae waialealae* similis; pedunculis (unico viso) ±8.5 cm. longis; ramis secundariis 3.5-4 mm. longis, circ. 4- vel 5-floris; pedicellis circ. 1.5-1.8 cm. longis; calice ad anthesin (plus minusve cylindrico-) obconico circ. 7-8 mm. alto et 4-5 mm. crasso mox 4- vel 5-angulato, corolla emissa hemisphaerico-conica, circ. 5.5 mm. alta et paulo latiore. Petala circ. 6, staminibus circ. 12-19.—Specimens examined: *Rev. John M. Lydgate*, 4-5 ft. tall, Hii Mountains, southeastern Kauai (type, Bish., my photograph no. 4,195).

The type had been labeled *Tetraplasandra waialealae* Rock, but from that species it differs in its small, long-petioluled leaflets, which are gently attenuate or acuminate at both ends, also in the small calyces and doubtless small fruits.

Tetraplasandra meiandra (Hillebr.) Harms, var. **Degeneri** var. nov.—Arbor, foliis ±4 dm. longis (petiolo ±1 dm. longo incluso); foliolis usque ad 9 vel 11, petiolulo tenui circ. 8-10 mm. longo; lamina diverse oblonga ovali-oblonga vel oblongo-obovata, integra, superne coriacea, apice retusa rotundatave, basi inaequilaterali, latissime cuneata usque rotundata, nunc 7×4.7 cm. nunc 9×6.8 cm. nunc 12×5.5 cm. Inflorescentia terminalis ter atque umbellate composita, plus minusve verruculosa; ramis primariis ±4 (ut videtur axe crasso ±2 cm. longo sustentis) patentibus 9-14.5 cm. longis et 3-6 mm. crassis; secundariis (radiis) numerosis etiam 18 vel 21, gracilibus, acriter angulatis, 3-5.5 cm. longis et 1-2 mm. crassis; tertianis (pedicellis) saepius 8-12, acriter angulatis, ante vel fere ad anthesin 10-12 mm. longis. Flores ad anthesin fructusque non visi. Flores prope anthesin parvi; calice cylindrico-prismatico, 6 mm. alto et circ. 3 mm. crasso, apice angustissime subbrunneo-marginato; corolla nondum aperta conica 4 mm. alta, petalis 5, staminibus 5.—Specimens examined: *Otto Degener* 18,021, in rain-forest, Kokee, northwestern Kauai, June 24, 1926 (type, N. Y., my photograph no 4,215: isotype, Mo., my photograph no. 4,216).

The large inflorescence on the type spray measures 2.7 dm. in diameter. The abundance of rays or secondary branches and the diminutive size of the florets distinguish this handsome tree at once from the other Kauai members of the genus.

Tetraplasandra meiandra (Hillebr.) Harms, var. **Skottsbergii**, var. nov.; *T. meiandra* var. *molokaiensis* Skottsb. Meddel. Göteborgs Bot. Trädg. 15: 412. 1944 exclud. syn. var. δ. Hillebr.—Petiolus usque ad 10.5 cm. longus; foliolis 7-9; lamina late elliptico-rectangulata usque subobovata, apice late rotundata obtusissima haud raro emarginata, basi asymmetrica rotundata contractave, 6-10 cm. longa et 3-6.5 cm. lata ("9×6.1, 8.5×5.3, 7.8×4.7, 6.5×3.7, 6×4.7, 6×3 cm."); petiolulis 6-9 mm. longis. Inflorescentia bis (vel ter?) umbellata. Pedunculi 8-19 cm. longi, radiis 11-17, plerumque 4-6.5 cm. longis, 5-8-floris, pedicellis 7-10 mm. longis. Drupae immaturae cylindricae, 9-10 mm. longae stylopodio hemisphaerico 2.5-3 mm. alto incluso; stigmatibus 3 vel 4 (rarius 5), sessilibus.—Specimens examined (**southeastern Molokai**): *Lucy May Cranwell* 3,528, Kawela, June 26, 1938 (type, Goth., my photograph no. 4,182: isotype, Bish., my photograph no. 4,227).

Skottsberg *(loc. cit.)* advanced the name *molokaiensis* as a *nomen novum* for Hillebrand's original, *Triplasandra meiandra* var. δ. of the *Tetraplasandra meiandra* var. δ. of later authors. He then gave a fresh description (evidently modified from his observations of the *Cranwell* material in the direction of Hillebrand's really unreconcilable description) and cited Miss Cranwell's material as an example. His real type basis for the name *molokaiensis* was, however, the type of Hillebrand's var. δ. Reference to Hillebrand (Fl. Haw. Isls. 153. 1888) shows Wailupe, Isl. Oahu, as the first cited locality. Two additional localities were listed, namely (1) Maunahui on Molokai and (2) Isl. Lanai; these will be referred to below under vars. *polyantha* and *Hillebrandii* respectively. The identity of the Wailupe and other Oahu specimens constituting a satisfactory basis for Hillebrand's var. δ. in its properly restricted sense will be discussed at a future date. We may observe for the present, however, that henceforth the var. δ., *typically of Oahu*, must bear under our International Rules of Nomenclature the name *molokaiensis*.

Tetraplasandra meiandra (Hillebr.) Harms, var. **polyantha**, var. nov.—Petiolus 6-8 cm. longus; foliolis 5-9, lamina oblanceolata vel anguste usque moderate obovata usque elliptico-rectangulata, apice obtusa usque rotundata rarius truncata rarissime emarginata, basi asymmetrica et cuneato-contracta usque rotundata, 5.5-10.5 cm. longa et 3-5.6 cm. lata, petiolulo

4-10 mm. longo. Inflorescentia plus minusve furfuracea ter umbellata; pedunculis ±3, circ. 8-12 cm. longis, robustis, compressis; radiis nunc ±12 nunc (pro eodem specimine) ±24, acriter angulatis et plus minusve compressis, 3-4.7 cm. longis, 8-18-floris, interdum 1 vel 2 inferius ortis, pedicellis tenuibus ad anthesin 4-7 mm. longis; petalis 4-5 mm. longis. Drupae ignotae.—Specimens examined (all from **eastern Molokai**): *Otto Degener*, west of Pepeopae, Apr. 12, 1928 (topotype, N. Y.); *Degener*, southeast of Pepeopae Bog, May 9, 1928 (topotype, N. Y.); *Degener* 17,793, rain-forest, west of Pepeopae, Apr. 12, 1928 (topotypes, Mo.; N. Y.); *Degener* 17,795, rain-forest, near Pepeopae Bog, Apr. 23, 1928 (type, N. Y., my photograph no. 4,231: isotype, N. Y., my photograph no. 4,232); *Degener* 18,018, rain-forest, west of Pepeopae, Apr. 12, 1928 (topotype, N. Y.); *Degener* 18,019, rain-forest, vicinity of Pepeopae Bog, Apr. 23, 1928 (topotypes, Mo.; N. Y.); *Abbé Urbain Faurie* 271, alt. 600 m., Pukoo, May, 1910 (Arn.; Par.); *Joseph F. Rock* 6,175, edge of gulch above Kamoku, Mar. 21, 1910 (Gray).

Hillebrand's material from Maunahui, within 5 km. of the Pepeopae Bog, was included by him, as above stated under var. *Skottsbergii*, in his *Triplasandra meiandra* var. δ., called by later writers, *Tetraplasandra meiandra* var. δ. His Maunahui specimen in the Berlin Herbarium was destroyed in World War II, but was doubtless the present variety. Rock and Faurie collected their materials ahead of Degener, but for obvious reasons one of Degener's excellent suites of more copiously collected and more widely distributed specimens has been selected for the type basis.

Tetraplasandra meiandra (Hillebr.) Harms, var. **mauiensis**, var. nov.—Folia magna, 3-4 dm. longa, petiolo 5-8 cm. longo; foliolis 5-9, lamina diverse elliptico-oblonga usque ovata vel subcuneato-obovata, apice obtusa usque rotundata vel paulum emarginata, basi inaequilaterali et cuneate contracta, usque ad 13.5 cm. longa et ad 7.2 cm. lata, vena mediana subtus coccinea; petiolulis elongatioribus 1-2.5 cm. longis. Inflorescentia sessilis vel subsessilis, ter umbellata, plus minusve furfuracea; pedunculis 3-6, saepe robustis, 8-15 cm. longis, subcompressis; radiis 10-25 (interdum 1-3 inferius ortis), acriter angulatis, 5-10 cm. longis, plerumque 10-20-floris; pedicellis 5-9 mm. longis; petalis 3.5-4 mm. longis. Drupae cylindricae circ. 11 mm. longae stylopodio hemisphaerico circ.

2.5 mm. alto incluso et circ. 5 mm. crassae; stigmatibus 3 vel 4, parvis. — Specimens examined (all from **East Maui**): *Charles N. Forbes* 1,713-*M*, large tree 35 ft. tall, trunk 1+ ft. diam., peduncles 5 or 6, rays 15-23 (occasionally 1-3 below), pedicels 13, leaflets 11 or 10, their midrib crimson beneath, ridge, left-hand side of Kipahulu, above the waterfall, Nov. 26, 1919 (Bish.); *Forbes* 1,726-*M*, large tree, 25-30 ft. tall, trunk diam. 3 ft., above Mokulau Landing, Dec. 7, 1919 (Bish.); *Forbes* 2,051-*M*, south slope of Haleakala, Mar. 20, 1920 (topotypes, Bish.; U. S.); *George C. Munro* 401, Auhi (Auwahi) or Ulupalakua, Feb. 12, 1915 (Bish.); *Joseph F. Rock* 8,666, lava fields, Auahi (Auwahi), November, 1910 (type, Gray, my photograph no. 4,233: isotypes, Arn., 2 sheets; Bish., my photograph no. 4,234; Gray, my photograph no. 4,236; U. S., my photograph no. 4,235); *Rock* 12,506, same place, March, 1912 (Bish.).

This variety is the one illustrated by Rock (Indig. Trees Haw. Isls. pl. 138. 1913) for an "Auahi" (Auwahi) tree of *T. meiandra* var. δ., growing at an elevation of 3,000 ft., and with trunk diameter of 2 ft. An isotype at Gray Herbarium has a glaucous hue to portions of the leaflets' upper surface. Definitely distinctive of the variety, however, seem to be the large leaves and leaflets (the latter with basally more cuneately contracted blade and with their median nerve crimson beneath when fresh and at time even when dry), the elongate petiolules, and the more elongate rays.

Tetraplasandra meiandra (Hillebr.) Harms, var. **leptomera**, var. nov.—Arbor ±9 m. alta, gemmis resinosis, foliis gracilibus ±2.5 dm. longis; foliolis 7-9 (-11), lamina angusto-oblonga usque late oblanceolata (pro foliolo terminali anguste obovata), apice rotundata usque obtusa raro subacuta, inferne plus minusve sensim ad basim cuneate angustata, 8-10 cm. longa et tantum 2-3 (pro foliolo terminali -4) cm. lata, nervo mediano vivo sine dubio coccinea; petiolulo tenui 5-10 mm. longo. Inflorescentia ter umbellata, pedunculis 3 vel 4 tenuibus, angulatis, irregulariter furfuraceis, 8.5-10.5 cm. longis; radiis 15-23, glabratis, angulatis, ad anthesin ±4.5 cm. longis et 1-1.5 mm. crassis, circ. 10-floris, pedicellis tenuibus ad anthesin tantum 3-5 mm. longis; petalis anguste lanceolatis 3-4 mm. longis, (fide lectoris) extus rubidis intus subviridi-albis, cum 6 staminibus alternantibus. Drupae ignotae.— Specimens examined (**East Maui**): *Charles N. Forbes* 1,930-*M*,

tree 30 ft. tall, buds gummy, petals reddish outside, greenish-white inside, stamens 6 and alternate with petals, 3 or 4 main peduncles. . . . Lauman Forest, south slope of Haleakala, Mar. 11, 1920 (type, U. S., my photograph no. 4,239: isotype, Bish., my photograph no. 4,240).

Tetraplasandra meiandra (Hillebr.) Harms, var. **ovalis**, var. nov.—Folia ±3.3 dm. longa, petiolo 4.5-9 cm. longo; foliolis 9-11, lamina plerumque oblonge ellipticeve ovali, apice obtusa rotundatave, basi asymmetrica plus minusve lato-cuneate angustata, laevi et obscure moderatave venulosa, 6-11 cm. longa et 3.2-6.2 cm. lata; petiolulo subtenui 5-8 etiam -17 mm. longo. Inflorescentia ter umbellata, pedunculis ±3, robustis usque subrobustis subangulatis sparsim furfuraceis 6.5-14 cm. longis; radiis ±20-22, acriter angulatis, demum 3-5.2 cm. longis, circ. 9-14-floris, pedicellis tenuibus demum 7-11 mm. longis; petalis moderate usque late etiam deltoide lanceolatis circ. 3.5-4 mm. longis. Drupae immaturae urceolatae circ. 7 mm. altae stylopodio anguste conico et stigmatibus saepius 4 inclusis et circ. 6 mm. crassae.—Specimens examined (all from **East Maui**) : *Otto Degener*, Pipe-Line Trail, Olinda, north-central E. Maui, June 16, 1927 (topotype, N. Y., my photograph no. 4,238) ; *Degener*, same place, Jul. 16, 1927 (N. Y.) ; *Degener (& Wiebke)* 2,317, rain-forest, ditch-trail, Olinda, June 16, 1927 (topotypes, N. Y., 2 sheets, my photograph no. 4,237) ; *Degener* 17,788, Pipe-Line Trail, Olinda, June 16, 1927 (Mo.; N. Y.) ; *Charles N. Forbes* 2,511-*M*, trees 20-30 ft. tall (several seen) . . . flowers very deep dark red, rhachis and midveins yellow-bronze, stamens 9 or 10, Papaaea, north slope of Haleakala, June 14, 1920 (Bish.) ; *Joseph F. Rock* 8,582, Waikamoi Trail, Olinda, September, 1910 (type, Gray, my photograph no. 4,246: isotype, Bish., my photograph no. 4,247) ; *Rock* 10,070, Kailua, trail to Honomanu, October, 1910 (Bish.).

Tetraplasandra meiandra (Hillebr.) Harms, var. **Hillebrandii** var. nov. —Folia 1.8-2.5 dm. longa, petiolo subrobusto 3.5-4.5 cm. longo, foliolis 5-9; lamina crassa coriaceaque, supra conspicue depresseque reticulato-venulosa, late oblongo-ovali usque subrotunda, apice rotundata (interdum etiam emarginata) usque obtusa raro vix subacuminata, basi plus minusve asymmetrica abrupte contracta interdum late cuneata, 4.5-11 cm. longa et 3.5-8.5 cm. lata; petiolulo robusto 5-10

mm. longo. Inflorescentia ter vel interdum bis umbellata, pedunculis 1 vel saepius 3 vel 4, vix robustis, sublaevibus, angulatis, 4-10 cm. longis; radiis 8-10, acriter angulatis, 8-12-floris; pedicellis tenuibus 6-12 mm. longis; petalis 5-7, circ. 4 mm. longis, staminibus isomeris. Drupae cylindricae siccescentes prismaticae, 1.5 cm. longae (stylopodio late conico fere 2 mm. alto et 3 vel 4 stigmatibus inclusis) et circ. 6-7 mm. crassae.—Specimens examined (all from **Isl. Lanai**): *William Hillebrand, anno* 1870 (type, Gray, my photograph no. 4,228: isotype fragment *ex herb. Hillebr. in Herb. Berol.*, Bish.); *George C. Munro,* Poomai, Apr. 18, 1914 (U. S.); *Munro* 199, Hookio Ridge, Sept. 28, 1913 (Bish.); *Joseph F. Rock* 8,015, alt. 2,600 ft., tip of ridge leading to Haalelepakai, Jul. 21, 1910 (Gray, my photograph no. 4,229); *Rock* (similarly) 8,015, Mahana ridge, Aug. 3, 1910 (Bish., my photograph no. 4,230).

Hillebrand had determined his collection originally as representing a new species of *Triplasandra,* but later on (Fl. Haw. Isls. 153. 1888) treated it, along with Oahu and Molokai material, as constituting his *Triplasandra meiandra* var. δ.

Tetraplasandra meiandra (Hillebr.) Harms, var. **prolifica,** var. nov.—Arbor, foliis ±3.5 dm. longis. Foliola saepius 9-13, lamina oblonga vel oblongo-ovali vel interdum oblanceolato-obovata, apice obtusa vel rotundata interdum emarginata, basi inaequilaterali rotundata vel lato-cuneate angustata, usque ad 12 cm. longa et ad 5.5 cm. lata, venulis supra parce reticulatis conspicuisve, sine dubio viventibus saepe coccineis; petiolulo 4-5 saepius -10 mm. longo. Inflorescentia sessilis ter umbellata, pedunculis ±3, subrobustis, sublaevibus, angulatis, 3.5-7 cm. longis; radiis 8-15 umbellate vel interdum subumbellate dispositis, angulatis, laevibus, 3-5 cm. longis, circ. 12-18-floris; pedicellis demum 8-12 mm. longis; petalis non visis; drupis ovoideis calice circ. 9 mm. alto latoque, stylopodio hemisphaerico circ. 6 mm. lato et 3-3.5 mm. alto apice in stylum brevem tenuemque contracto, stigmatibus 2.—Specimens examined (all from **Isl. Hawaii**): *Joseph F. Rock,* Puuwaawaa, August, 1917 (topotype, Bish.); *Rock* 3,857, same place, June 17, 1909 (topotype, Bish.); *Rock* 12,509, same place, February, 1912 (type, Bish., my photograph no. 4,241: isotype, Gray, my photograph no. 4,242).

The shape and dimensions of the mature fruit are described from a Forbes specimen, a forma with the leaflets slightly

narrower and apically less rounded, also somewhat more clearly reticulate-venulose and lacking the reddish hue of the type's principal veins.

Tetraplasandra meiandra (Hillebr.) Harms, var. **prolificoides**, var. nov.—Arbor ±9 m. alta, varietati *prolificae* valde similis sed differens: foliolis paulo brevioribus latioribusque, venulis subvaldius conspicuis, petiolulo paulo breviore, pedicellis tantum 4-6 mm. longis umbellulis itaque compactioribus. —Specimens examined (all from **Isl. Hawaii**): *G. O. Fagerlund & A. L. Mitchell* 945, tree 30 ft. tall, Waiho, Puuwaawaa, Nov. 21, 1944 (Bish.); *Joseph F. Rock* 3,855, woods back of Puuwaawaa, June 17, 1909 (type, Gray, my photograph no. 4,243); *Rock* 3,858, Puuwaawaa, June 16, 1909 (topotype, Gray).

Tetraplasandra meiandra (Hillebr.) Harms, var. **rhynchocarpa**, var. nov.—Arbor usque ad 18 m. alta. Folia ±3.5 dm. longa; foliolis ±9, lamina oblonga rarius ovata vel subobovata utrinque obtusa vel basi obliqua rotundata rarius subtruncata, 6-12 (-15) cm. longa et 3.5-5.5 (-6.8) cm. lata; petiolulo tenui 3-8 mm. longo. Inflorescentia composita; pedunculo (unico viso) ±10.5 cm. longo, vix furfuraceo, compresso, circ. 5 mm. lato; radiis umbellatis 9+, subglabratis, angulatis, 5.5-6.7 cm. longis et 2-3 mm. crassis, ±10-floris; pedicellis demum 8-15 mm. longis, vix tenuibus; petalis non visis; drupis elongate cylindrico-prismaticis, calice demum 12-14 mm. longo et 5-6 mm. crasso, stylopodio conico elongato rhynchoideoque 3-4 mm. alto (3 vel 4 stigmatibus inclusis).—Specimens examined (all from **Isl. Hawaii**): *Otto Degener* 17,790, in jungle, between Glenwood and 29 Miles, June 24, 1929 (N. Y.); *Degener* 18,252, same place and date (Mo.; N. Y.); *Degener & Henry Wiebke* 2,184, wet jungle, between Glenwood and Kilauea, Jul. 27, 1926 (topotypes, Mo., 2 sheets; N. Y., 3 sheets; U. S.); *Joseph F. Rock*, Kilauea Volcano, December, 1914 (topotype, Bish.); *Rock*, a large tree 50-60 ft. tall, near 29 Miles Forest, August, 1917 (Bish.); *Rock* 12,993, Kilauea Volcano Forest Reserve, August, 1917 (type, Bish., my photograph no. 4,251).

Tetraplasandra meiandra (Hillebr.) Harms, var. **Rockii**, var. nov.—Folia ±3.5 dm. longa; foliolis 7-13, petiolo 5-10 cm. longo; lamina crassiore coriaceoreque, oblonga vel inter-

dum subovata vel subobovata, utrinque obtusa vel rotundata, basi asymmetrica, supra plerumque depresse reticulateque venulosa, 7-11 cm. longa et 4-6.5 cm. lata; petiolulo 4-12 mm. longo nunc tenui nunc latiore. Inflorescentia ter umbellata; pedunculis circ. 5, robustis, compressis, rugosis, 5-9.5 cm. longis; radiis 5-16, angulatis, paulum furfuraceis, saepius 3-6 cm. longis, 5-12-floris; pedicellis crassis 5-8 mm. longis; petalis non visis; drupis cylindrico-ovoideis, 11-12 mm. altis (stylopodio depresso-hemisphaerico brevique et 3 vel 4 stigmatibus inclusis) et circ. 7 mm. crassis.—Specimens examined **(southernmost Hawaii)**: *Joseph F. Rock* 10,006, alt. 3,000 ft., woods of Naalehu, Kau, Jan. 9, 1912 (type, Gray, my photographs no. 4,248 and 4,249: isotypes, Arn.; Bish., my photograph no. 4,250; Gray, 2 sheets).

Rock (Indig. Trees Haw. Isls. 349, pl. 139. 1913) gave a short description and an excellent illustration of this tree, which he referred to *Tetraplasandra meiandra* var. ζ. The type of *T. meiandra* var. ζ. (named var. *hiloensis* below) came, however, from the woods of Hilo, northeastern Hawaii, and had peduncles 10-17.8 cm. long, fruiting pedicels very slender and elongate (Hillebrand gave the length as 10-12 lines, and the fragment of his type from Berlin at Bishop Museum has a pedicel 22 mm. long!), and 4-6 stigmas on a short slender stylopod resting upon the truncate or slightly depressed apex of the drupe, this surrounded by the conspicuous brownish border of the calyx-limb.

Tetraplasandra meiandra (Hillebr.) Harms, var. **hiloensis**, primum nominata; syn. *Triplasandra meiandra* var. ζ. Hillebr. Fl. Haw. Isls. 153. 1888.—The above cited fragment of the type of Hillebrand's var. ζ. is now before me. In view of the destruction by war of the type itself, this fragment is of the greatest importance. It consists of one mature drupe and one leaflet. The elongate, delicate fruiting pedicel (22 mm. long) is distinctive, as also the short, slender stylopod with six shiny, brown stigmas, these forming a solid cluster less than 1 mm. across. The ovoid-truncate body (calyx portion) is 1 cm. tall and about 7 mm. thick. The oblong leaflet has a blade 10.2×5.7 cm. The venation is not especially depressed or salient or reticulate, but the median vein appears to have been crimson beneath when fresh.

Tetraplasandra meiandra (Hillebr.) Harms, var. **tenuistylis**, var. nov.—Folia ±4 dm. longa, foliolis ±11, lamina plerumque oblonga, apice obtusa usque rotundata, basi interdum obliqua lato-cuneate contracta, subinsigniter reticulato-venulosa, 8-14 cm. longa et 4-6.5 cm. lata; petiolulo tenui vel sublato 8-18 mm. longo. Pedunculi (forsitan solitarii) 5.5-10 cm. longi, plus minusve robusti (inferne 4-11 mm. crassi), laevescentes; radiis ±10-15, angulatis, sublaevibus, 3.5-5.5 cm. longis, circ. 10-15-floris; pedicellis subrobustis, demum 8-12 mm. longis; petalis non visis; drupis urceolato-ovoideis, apice truncatis, circ. 12-12.5 mm. altis stylopodio (stylo) tenui et 2 vel 3 stigmatibus inclusis et ±7 mm. crassis.—Specimens examined: *Joseph F. Rock* 10,362, Volcano Kilauea, Isl. Hawaii, December, 1914 (type, Bish., my photograph no. 4,252: isotype, Gray).

The leaflets have a brownish venation in the dry state, but the original color seems to have been reddish or crimson.

Tetraplasandra meiandra (Hillebr.) Harms, var. **simulans**, var. nov.—Folia ±3.5 dm. longa, petiolo elongato 11-13.5 cm. longo, foliolis paucis ±7, lamina subanguste oblonga usque oblongo-obovata, apice saepius subabrupte contracta et breviter acuminata raro rotundata etiam emarginata, basi rotundata vel lato-cuneate angustata, non conspicue reticulato-venulosa, interdum ut videtur superne glauca, 10-13.5 cm. longa et 4-6.4 cm. lata; petiolulo 6-16 mm. longo. Inflorescentia normaliter sessilis et tantum bis umbellata, pedunculis 3 vel 4, saepius elongatis etiam 12-18 cm. longis, compressis subangulatisque; radiis deficientibus; pedicellis numerosissimis usque ad ±30, elongatioribus post anthesin 22-25 mm. longis; petalis 6 vel 7, ±6.5 mm. longis; drupis maturis ignotis, valde immaturis obconico-cylindricis, apice truncatis, circ. 6 mm. altis et 3 mm. crassis, stylopodio minimo valde compresso, stigmatibus 2.—Specimens examined: *Joseph F. Rock* 8,429, Awini, Kohala, northwesternmost Hawaii, June, 1910 (type, Bish., my photograph no. 4,244: isotypes, Arn.; Bish., my photograph no. 4,245; Gray; U. S.).

In its lack of rays between peduncles and pedicels, also in its large number of pedicels, this variety simulates the otherwise quite different *T. kohalae* Skottsb., the type locality of which is only a few kilometers to the southeast of Awini. Besides these two characters the peduncular length, the acutish tips of most of the leaflets, the elongate petioles, and the

small number of leaflets for such large leaves, combine to distinguish the var. *simulans* easily from all others on the Island of Hawaii. Indeed, were it not for the multiplicity of connecting intermediate or overlapping varieties known in the great *T. meiandra* complex, var. *simulans* might seem better segregated as a distinct species.

Tetraplasandra meiandra (Hillebr.) Harms, var. **bisobtusa** primum nominata; *Triplasandra miandra* var. γ. Hillebr. Fl. Haw. Isls. 152. 1888.

Tetraplasandra meiandra (Hillebr.) Harms, var. **makalehana** var. nov.—Arbor ±4.5 m. alta, trunco ±2 dm. crasso; foliolis 7-9, lamina ovatis usque oblongis, apice obtusis usque vix acuminatis, basi rotundatis vel cuneato-contractis, coriaceis usque chartaceis, 10-17.5 cm. longis et 5-7.5 cm. latis; petiolo 6.5-8.5 cm. longo; petiolulis lateralibus 4-10 mm. longis. Inflorescentia ter (rarius pedunculo solitario bis) umbellata, pedunculis ±2 (interdum 5, e rhachi elongata ortis fide Hillebrandii), gracilibus, 6-8 cm. longis; radiis 8-14, laevibus, circ. 2.5-4 cm. longis, 8-14-floris; pedicellis tenuibus 7-11 mm. longis; bracteis 4 mm. longis. Petala staminaque 5, stigmatibus nunc 2 nunc 3, stylopodio depresso-conico humilique; drupa ovoidea et compressa trigonave, circ. 8 mm. alta.—Specimens examined: *William H. Hatheway* 209, tree 15 ft. tall, trunk 8 in. in diam., base of fruit green, its tip scarlet, pollination by bees, on dry, sunny slope . . . alt. 1,200 ft., east side, Makaleha Stream, Isl. Oahu, Aug. 21, 1950 (type, Chi., my photograph no. 4,275: isotype, Gray, my photograph no. 4,276).

Triplasandra meiandra var. β. Hillebr. (Fl. Haw. Isls. 152. 1888) from Makaleha undoubtedly belongs here.

Tetraplasandra meiandra (Hillebr.) Harms, var. **ramosior** var. nov.—Arbor ±6 m. alta, foliolis 9-11, lamina anguste oblongis usque ovalibus vel terminali obovatis, coriaceis, apice subacuminatis, basi cuneate contractis, 7-12 cm. longis et 2.5-4.8 cm. latis, supra plus minusve depresso-reticulato-venulosis; petiolulis elongatis 1-3 cm. longis, petiolo 7-9 cm. longo. Inflorescentia e rhachi ±1 dm. longa orta, pedunculis circ. 6-9, circ. 4.5-6 cm. longis, ±8-radiatis, radiis compressis angulatisve 1.5-3.5 cm. longis ±7-10-floris, pedicellis tenuibus 6-9 mm. longis. Petala staminaque non visa, drupis immaturis urceolato-cylindricis, calice circ. 6 mm. alto et 4 mm.

crasso, stylopodio conico circ. 2 mm. alto stigmatibus plerumque 5 raro 4 inclusis.—Specimens examined: *G. R. Ewart, III, & G. C. Munro* 129, growing 6 m. tall, alt. 3,900 ft., Haelaau-Puu Kukui trail, West Maui, Dec. 18, 1928 (type, Bish., my photograph no. 4,281); *G. R. Ewart, III,* no. 100, alt. 3,900 ft., in rain-forest, Haelaau, West Maui, Dec. 19, 1928 (topotype, Bish., my photograph no. 4,282).

The presence of a rhachis is exceptional in *T. meiandra* (but *cf.* quotation from Hillebrand under var. *makalehana* above).

Tetraplasandra meiandra (Hillebr.) Harms, var. **olowaluana** var. nov.—Foliis varietati *ramosiori* plus minusve similis, sed foliolis apice interdum magis acuminatis rotundatisve. Inflorescentia ter umbellata (nulla rhachi), pedunculis ±3 elongatis saepius 1-1.5 dm. longis, 8-15-radiatis; radiis angulatis 3-6 cm. longis, 8-15-floris; pedicellis tenuibus 5-8 mm. longis. Drupae globoso-cubicae vel breviter trigono-prismaticae, calice circ. 6 mm. alto et subaequaliter crasso, stylopodio conico ±1.6 mm. alto, stigmatibus nunc 3 nunc 4.—Specimens examined: *Charles N. Forbes* 2,276-*M,* tree 30 ft. tall, one seen in gully far up, Olowalu Valley, West Maui, May 9, 1920 (type, Bish., my photograph no. 4,278); *Forbes* 2,313-*M,* ridge, left-hand side of Olowalu Valley, May 10, 1920 (topotype, U. S., my photograph no. 4,279).

Tetraplasandra hawaiiensis A. Gray, var. **awiniensis,** var. nov.—Arbor 7.5-15 m. alta. Foliola paulo angustiora, omnia (non solum terminale) ad petiolulum plerumque sensim vel subsensim angustata. Inflorescentiae paniculae solitariae vel 2-5 in umbella sessili congregatae. Umbellulae ad anthesin numerose (saepius 7-11-) florae, pedicellis crassiusculis tantum 5-7 mm. longis et densissime conspicuissimeque flavido-brunneo-tomentosis. Flores minores, petalis tantum circ. 4 mm. longis. Drupae paulo minores, circ. 6-8 mm. crassae; pedicellis demum elongatis tenuioribusque etiam 1.5-2.1 cm. longis.—Specimens examined (**Isl. Hawaii**): *Otto Degener & Amy Greenwell* 21,898, beautiful tree of forested slopes, Pololu-Honokanenui region, North Kohala, Feb. 18, 1952 (topotypes, Bish.; Calif. Acad.; Chi., 3 sheets, my photograph no. 4,264; Del.; Gray; Kew; Mo.; N. Y.; Phila.; Univ. Calif.; U. S.); *Joseph F. Rock* 8,386, tree 25 ft. tall, woods of Awini, North Kohala, June, 1910 (type, Arn., my photograph no. 4,261: isotypes, Bish., my photograph no. 4,263; Gray, 3 sheets, my photograph no. 4,262).

Tetraplasandra hawaiiensis A. Gray, var. **gracilis**, var. nov. —Folia ±4.5 dm. longa; petiolo ±13 cm. longo; foliolis 5-9, pro lateralibus petiolulo brevi 2-10 mm. longo, lamina angustiore minoreque angusto-oblonga, apice subacuta obtusave, basi (pro lateralibus) inaequilaterali subcuneate attenuata, 6-12 cm. longa et 3-4 cm. lata. Inflorescentiae rami ramulique tenuiores, umbellulis pauci- (plerumque 3-6-) floris, pedicellis ad anthesin tenuibus 8-14 mm. longis. Calyx prope anthesin parvus, circ. 3 mm. altus et 3-5 mm. latus; petalis 5, prope anthesin vix 6 mm. longis; staminibus ±15; stigmatibus circ. 10; drupis urceolato-cylindricis, circ. 10-costatis, calice circ. 5 mm. alto et lato, apice truncato abrupte in stylopodium tenuem cylindricum circ. 1-1.3 mm. altum angustato.—Specimens examined: *Joseph F. Rock & S. T. Hashimoto* 16,033, Waihee Valley, West Maui, September, 1918 (type, Bish., my photograph no. 4,268: isotype, Bish., my photograph no. 4,269).

The leaflets are similar to those of var. *awiniensis* but apically somewhat more acute. The umbellets are fewer- (3-6- not 7-11-) flowered and the pedicels at flowering are longer (8-14 not 5-7 mm.), more slender, and much less densely and less conspicuously tomentose, even glabrescent here and there. The corolla just before opening is conical, about 5 mm. tall, and if dried becomes strongly angulate; for var. *awiniensis* the corolla at this stage is depressed-conical to subhemispherical, about 3-4 mm. tall, and dries more smoothish.

Tetraplasandra hawaiiensis A. Gray, var. **microcarpa**, var. nov.—Foliola anguste usque late oblonga, usque ad 1.8 dm. longa et ad ±7 cm. lata, apice obtusa usque acuta. Calyx minor ad anthesin tantum 3-4 mm. altus et subaequaliter crassus; petalis 5-7, tantum circ. 5-6 mm. longis; staminibus plerumque tantum 17-20. Drupae minores corpore depresso-globoso tantum 5-7 mm. crassae, apice truncatae usque convexae, 9-13-loculatae; costis exterioribus succescentibus acrioribus. — Specimens examined, **Isl. Molokai:** *Edwin H. Bryan, Jr.* 618, tree 10 m. tall, trunk diam. ±2.5 dm., heartwood pithy and cream-colored, sapwood hard and of light color, on slopes of gulches and flat, lower edge of rain-forest, alt. 300 m., Kainalu, Jul. 24, 1927 (Bish., 2 sheets); *Otto Degener*, east part of Kaluaaha plateau, Jul. 3, 1928 (topotypes, N. Y.; U. S.); *Degener* 18,017, forest, same place and date (topotypes, Mo.; N. Y., 3 sheets; U. S.); *Abbé Urbain Faurie* 269, alt. 600 m., Pukoo, May, 1910 (Arn.; Bish.; Par.);

Charles N. Forbes 508-*Mo*, tree 25-30 ft. tall, ridges south of valley, Halawa, September, 1912 (Bish., 2 sheets); *William Hillebrand*, Molokai (Bish.; Gray; Kew; U. S., where locality is given as Leper Settlement—*cf.* "Kalauwau" of Hillebrand's text, p. 155, a locality not known to me); *Joseph F. Rock*, Kaluaha (Kaluaaha), March, 1910 (topotype, N. Y.); *Rock* 7,006, above "Kaluaha" (Kaluaaha), April, 1910 (type, Bish., my photograph no. 4,266: isotypes, Arn., 2 sheets; Gray, 2 sheets, my photograph no. 4,265); *G. W. Russ*, Ahaino, above Forest Reserve Line, December, 1932 (Bish., 2 sheets).

East Maui: *Otto Degener*, along ditch trail between Honomanu Valley and Keanae, Jul. 14, 1927 (Mo.); *Degener*, near ditch trail, Keanae Valley, Jul. 19, 1927 (Mo.; N. Y.); *Degener* 17,787, near Keanae Valley, Jul. 19, 1927 (N. Y.); *Degener* 17,788, precipitous canyon slope, along ditch trail at Keanae Valley on Honomanu Valley side, Jul. 14, 1927 (N. Y., 2 sheets; U. S.); *Degener & Wiebke* 2,316, only one tall tree on exposed cliff along ditch trail, Honomanu Valley, Jul. 14, 1927 (Univ. Calif.; N. Y., 3 sheets; U. S.).

West Maui: *Degener*, with both glabrous and tomentose leaves on same tree, half-mile north of Keahikauo, Jul. 21, 1927 (N. Y.); *Degener* 2,319, tall trees in dicranopteris-tangled forest, same place and date (Mo.; N. Y., 2 sheets); *Charles N. Forbes* 108-*M*, ridge west of Iao Valley, June, 1910 (Bish.); *William Hillebrand*, "Kanapali" (Kaanapali; U. S., where mounted on same sheet with Hillebrand's Leper Settlement material from Molokai); *Horace Mann, Jr. & William T. Brigham* 378, West Maui (Bish.; Gray; Mo.).

Isl. Lanai: *Forbes* 141-*L*, mountains near Koele, June, 1913 (Bish.); *Forbes* 377-*L*, locality not specified, September, 1917 (Bish.); *George C. Munro* 39, edge of Huola, east side of mountain, August, 1913 (Bish., 2 sheets); Munro 140, Lanaihale, west face, Nov. 17, 1913 (fruiting; Bish.) and Maunalei *mauka*, Jul. 19, 1915 (flowering; Bish.); *Rock* 8,016, Haalelepakai, main ridge, Jul. 21, 1910 (Gray; U. S.); *Rock* 8,016*a*, Mahana ridge, July, 1910 (Bish.); *Rock* (similarly) 8,016*a*, Haalelepakai, south slopes of main ridge, August, 1910 (Gray, 2 sheets); *Rock* 8,050, main ridge, Jul. 22, 1910 (Bish.).

Tetraplasandra pupukeensis Skottsb., **var. nitida** Degener & Sherff, var. nov.—Folii petiolus usque ad 12.5 cm. longus,

petiolulis lateralibus 4-12 mm. longis; folioli lamina varie oblonga lanceolato-oblonga ovata etiam subovata, apice varie obtusa usque acuminata, basi cuneate contracta vel raro subrotundata, sicca supra plerumque nitida, nervis lateralibus saepius conspicuis. Inflorescentia sessilis bis umbellata, pedunculis ±4, arcuatis rectisve, 8-16 cm. longis, subrobustis (circ. 5-6 mm. crassis), 10-25-floris; pedicellis 1.5-2 cm. longis, robustis, circ. 2 mm. crassis. Calyx ad anthesin obconicus, 7 mm. altus et supra ±5 mm. latus; petalis circ. 8-10; staminibus 16-28; stigmatibus ±5; drupis non visis.—Specimens examined: *Degener, Murashige, & Kerr* 21,017, tree 20 ft. tall, in rainy forest, alt. 3,500 ft., Mt. Kaala, Isl. Oahu, Jul. 10, 1949 (type, Chi., my photograph no. 4,271: isotypes, Arn.; Bish.; Gray; N. Y.; Phila.; Univ. Calif.; U. S.).

Tetraplasandra pupukeensis Skottsb., var. **venosa** Degener & Sherff, var. nov.—Foliola laminis ut videtur crassiora, supra valde reticulato- et depresso-venosa, ovata usque oblongo-ovata, apice obtusa usque rotundata, basi subrotundata vel saepius latissime cuneata, terminale usque ad 1.5 dm. longa et ad 9 cm. lata, lateralia tertio minora (longitudine latitudineque). Inflorescentia bis umbellata, pedunculis ±3, circ. 7-13 cm. longis, robustis (5-7 mm. crassis), plus minusve furfuraceis; pedicellis 13-28 in umbellula terminal congregatis vel unico 1-2 cm. inferius posito, 1.4-2.8 cm. longis, subrobustis. Calyx ad anthesin obconicus, circ. 7 mm. altus et limbo circ. 5 mm. latus; petalis circ. 8; staminibus ±16; drupis vix maturis cylindrico-prismaticis, 5- vel plerumque 6-costatis, calice circ. 12 mm. alto et 7-8 mm. crasso, stylopodio conico circ. 2 mm. alto et basi 3 mm. crasso, stigmatibus 5 vel saepius 6.—Specimens examined: *Otto Degener,* Isl. Oahu (N. Y., 2 sheets); *Degener,* Pupukea-Kahuku, Oahu, Jul. 19, 1931 (N. Y.); *Degener,* in gully southeast of Kahuku entrance of Pupukea-Kahuku Trail, Oahu, Nov. 22, 1931 (type, N. Y., 2 sheets, my photographs no. 4,224 and 4,225).

Tetraplasandra pupukeensis Skottsb., var. **megalopoda,** var. nov.—Foliola minora; lamina varie oblonga oblongo-ovali vel (praecipue terminali) obovata usque subrhomboideo-obovata, apice subacuminata usque truncata rotundatave etiam emarginata, basi cuneate contracta, sub 11.5 cm. longa et 5.5 cm. lata, conspicue reticulato- (et supra depresso-) venosa, facie superiori plus minusve nitida. Pedunculi forsitan solitarii

maximi, 1.7 dm.×4 mm. usque ad 2.6 dm.×9 mm., apice ±30-pedicellati; pedicellis subtenuibus, arcuatis, 2.5-4 cm. longis. Calyx ad anthesin obconicus, circ. 8 mm. altus et limbo circ. 6 mm. latus; petalis ±8, staminibus ±16; drupis immaturis, calice cylindrico-prismatico, costato, circ. 11 mm. alto et limbo 7 mm. crasso; stylopodio conico 3 mm. alto, stigmatibus plerumque 5 raro 6.—Specimens examined: *Otto Degener* 2,921, Pupukea-Kahuku Trail, Isl. Oahu, Nov. 23, 1924 (topotype, N. Y.); *Degener* 17,792, along summit divide toward east of Pupukea-Kahuku Trail, shrubby rain-forest, Dec. 6, 1931 (topotype, N. Y., my photograph no. 4,272; *David LeRoy Topping* 2,921, Pupukea-Kahuku Trail, Nov. 23, 1924 (type, Univ. Calif., my photograph no. 4,222).

Chicago Natural History Museum, Chicago, Illinois.

BOTANICAL LEAFLETS

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I. Some new or otherwise noteworthy Compositae from the Hawaiian Islands.

By Earl Edward Sherff

In this and the following articles the abbreviations used for depositories cited in the text are the same as previously listed (Bot. Leafl. no. 4: 2, no. 5: 2, and no. 6: 2), with the addition of Len., Herb. Botanical Garden (Hort. Petrop.) of Leningrad, U.S.S.R.

Lipochaeta Rockii Sherff, Bot. Gaz. 95: 100. 1933; Bish. Mus. Bull. no. 135: 70, *fig.* 24. 1935.—Typical *L. Rockii* has been collected on the Island of Molokai from the western end eastward as far as Puu Kolekole and Kamalo. Its leaves are "3-5-lobed or subpedately 3-5-parted; lobes membranaceous, dentate or again lobulate, subrotund to linear-oblong, commonly obtuse, the terminal one longer or even elongate and laterally laciniate-dentate." The var. *subovata* Sherff (Bot. Gaz. 95: 101. 1933; Bish. Mus. Bull. no. 135: 71, *fig.* 25. 1935) has been known definitely only from Mokomoko to Kawela Valley in eastern Molokai. Its principal leaves are much less dissected, being "deltoid-ovate or subovate, coarsely dentate or incisely lobulate." Recently Dr. Degener has made collections of *L. Rockii* in western Molokai and among his *exsiccatae* is one large suite with perhaps two dozen typical specimens and a dozen or so more with less dissected leaves, displaying a moderate approach toward the var. *subovata: Degener* 22,209, gulch near main road, between airport and Homelani Cemetery, on ledges safe from cattle, Mar. 16, 1952 (Berl.; Bish.; Chi.; Del.; Gray; Kew; N.Y.; Par.; Phila.; U.S.; etc.).

Lipochaeta heterophylla var. **molokaiensis** Sherff, Bot. Gaz. 95: 96. 1933; Bish. Mus. Bull. no. 135: 67. 1935.—This variety was cited by me formerly as of "northwesternmost Molokai." The distribution may now be described as "far western Molokai." Dr. Degener has recently sent me a large suite of speci-

mens (his no. 22,207) which he found Mar. 16, 1952, at Waiele, southwesternmost Molokai, and noted as "still common on and about red cinder cone." Specimens are being sent to many of the larger herbaria.

× **Dubautia paludicola** nom. nov.; *Dubautia paleata* × *D. waialealae*, Sherff, Bot. Gaz. 96: 152. 1934 and Bishop Mus. Bull. no. 135: 105, fig. 37. 1935.—Folia conferta (internodiis hispidis, saepius 2-6 mm. longis), spathulato-oblanceolata, nunc 4-5 cm. longa et 7-12 mm. lata nunc 7-9 cm. longa et 1.2-1.6 cm. lata, apice acuta, basi 3-6 mm. lata, utraque facie adpresso-hispida. Capitula paniculate vel contracto-corymbose disposita, varia sed capitulis *D. waialealae* affinia. Frutex *D. paleatae* foliorum magnitudine, circumambitu, textu, dispositioneque similior, sed *D. waialealae* inflorescentiae densitate et plurimis notis capitulorum propior.—*Otto Degener & Amy Greenwell*, Alakai Swamp, Isl. Kauai, Jan. 19, 1952 (Chi.); *A. S. Hitchcock* 15,468, in bog, alt. 3,600-5,080 ft., Waialeale, Isl. Kauai, Oct. 22-24, 1916 (U.S., my photograph no. 2,762); *Hitchcock* 15,492, same date and location (type, U.S., my photograph no. 2,763).

The recent finding of the *Degener & Greenwell* specimens of this putative hybrid in Alakai Swamp, more than three decades since Hitchcock collected it in a bog on near-by Waialeale, lends new interest to the matter of its derivation. It has always seemed to me certain that the two parents were *D. paleata* A. Gray and *D. waialealae* Rock, nor does there appear any reason to alter this opinion now. However, until such time as a scientific investigation shall determine the parentage for certain, it seems best to employ a non-committal epithet, such as *paludicola*.

× **Dubautia mendacoides** Degener & Sherff, hybr. nov.—Frutex ut videtur inter *D. laevigatam* A.Gr. et *D. laxam* H. & A. intermedius, attamen e × *D. mendaci* Sherff differens: foliorum laminis facie inferiore marginibusque glaberrimis, inflorescentiae ramulis axeque minutius hispidis.—Specimens examined: *Otto Degener & Amy Greenwell*, ridge behind Papaa, Moloaa Forest Reserve, Isl. Kauai, Jan. 16, 1952 (type, Chi., my photograph no. 4,304: isotypes, Berl.; Bish.; Gray; Kew; N.Y.; Phila.; U.S.).

In my revision of the genus *Dubautia* Gaud., × *D. mendax*,

"a hybrid probably between *D. laevigata* and *D. laxa*," was described (Bishop Mus. Bull. no. 135: 95, fig. 33, 1935). It had come from the Waimea Drainage Basin, at the west side of Kauai. × *D. mendacoides* comes from extreme northeastern Kauai and differs at once in its completely glabrous leaf-blades (in × *D. mendax* the margins and lower surfaces are appressed-hispid), and in the more delicately hispid axis and branchlets of the inflorescence. The margined petioles are moderately and very finely ciliate.

Railliardia latifolia A. Gray, Proc. Amer. Acad. 5: 132. 1861; *Dubautia latifolia* (A. Gray) Keck, Occas. Paps. Bishop Mus. 11: no. 19: 26. 1936.—Gray's type was a Kauai plant that had been collected by the United States South Pacific Exploring Expedition under Captain Wilkes, 1838-1842. His description was meagre: "foliis oppositis planis amplis oblongis penninerviis reticulato-venulosis dissitis subpetiolatis cum ramis elongatis patentibus glaberrimis; capitulis 4-5-floris numerosissimis in panicula nuda composita effusa.—Island of Kauai. A rambling shrub." His type fragment at Gray Herbarium (my photograph no. 2,568) and his ample type specimen (U.S., my photograph no. 4,309) show the leaf-blade to have been gradually cuneate-attenuate from about the middle to the subpetiolate base. A suite of excellent specimens of this species was collected recently in what may have been the type locality: *Otto Degener & Amy Greenwell* 21,740, coarse, sprawling vine, florets yellow, among dense shrubs and scattered trees, along road to Mohihi River, Kokee region, northwestern Kauai, Jan. 12, 1952 (Berl.; Bish.; Chi.; Del.; Gray, my photograph no. 4,306; Kew; N.Y.; Par.; Phila., my photograph no. 4,307; U.S.). The leaf-blades are mostly 8-13 cm. long and 2.5-4 cm. wide, oblong to oblanceolate, and attenuate at both ends, being elongate-cuneate from about the middle to the base and attenuate-acuminate to acuminate-caudate at the tip. The small but leafy bracts of the inflorescence, where still remaining, are narrowly oblong-lanceolate, about 2-2.6 cm. long and 7-11 mm. wide, sessile or subsessile and rounded at the base, attenuate-acuminate toward the tip.

In the past, various collections from Kauai by *Knudsen, Mann & Brigham, Rock,* and *Skottsberg* have been determined as *B. latifolia* and were so listed in my revision of *Railliardia* in 1935 (Bishop Mus. Bull. no. 135: 112). One of these col-

lections is now before me, namely, *A. A. Heller* 2,887, on Kaholuamanu, above Waimea, Oct. 11-16, 1895 (Chi.; Par., my photograph no. 2,606). The leaf-blades are proportionately broader, being up to about 15 cm. long and 6-8 cm. wide. They are more elliptic-oblong, merely acute or subacuminate at tip, and definitely rounded or subtruncate at the broadish base. The principal bracts subtending the lateral branches of the inflorescence vary similarly and measure up to 4.8 cm. long and 1.5 cm. wide. It is clear that these foliar and bracteal characters are sufficient to connote a worth-while variety:

Railliardia latifolia Helleri var. nov.—Foliorum laminae latiores, usque ad ±15 cm. longae et ad ±6.8 cm. latae, magis elliptico-oblongae, apice tantum acutae subacuminataeve, basi latiusculo certe rotundatae subtruncataeve. Inflorescentiae bracteae principales foliis similes sed multum minores, sub 4.8 cm. longae et 1.5 cm. latae.—Specimens examined: *Heller* 2,887, on Kaholuamanu, above Waimea, west-central Kauai, Oct. 11-16, 1895 (type, Chi., my photograph no. 4,308: isotypes, Gray; Kew; Len.; Mo.; N.Y.; Par., my photograph no. 2,606; U.S.).

An illustration of this variety appears in Degener, Flora Hawaiiensis, fam. 344, under name *Railliardia latifolia,* Mar. 17, 1939, and much of the related text (*e.g.,* "Leaves . . .acute at apex, rounded at base") belongs likewise to this variety. Indeed, Degener even quotes Heller's description of the plant as he (*i.e.,* Heller) observed it on Kaholuamanu. The description will bear repeating here: "It is really a vine. The main stem is often two inches in diameter, and twenty or thirty feet in length. The flowering branches are found running and twining over the branches of trees, one tree near Gay & Robinson's Kaholuamano [*sic!*] house, above Waimea, Kauai, having its top completely covered with the vine. The inflorescence is a large panicle, often two feet in length, and is very handsome when covered with the yellow flowers, which bear some resemblance to the flowers of our goldenrods."

× **Bidens dimidiata** Deg. & Sherff, *ex* Sherff, Amer. Journ. Bot. 38: 66. 1951.—The type of this putative hybrid of *Bidens Cosmoides* (A. Gray) Sherff with some other species of *Bidens* came from the west side of Waimea Canyon, Isl. Kauai. Recently Dr. Degener has collected a suite of essentially identical

specimens (his. no. 21,501) *mauka* of Waipoo Falls, east side of Kokee Stream, on the same island. They were "very common in forest" and bore flowering heads at the date of collection, Jan. 3, 1952. Somewhat earlier (Dec. 30, 1951) he collected two suites growing within 100 feet of each other on a precipitous, forested slope southwest of Malua Popoki, Kokee region, Isl. Kauai. One suite, his no. 21,493, was × *B. dimidiata* and the other, his no. 21,492, was typical *B. sandvicensis* Less. Whether or not *B. sandvicensis* is the other parent of × *B. dimidiata* will demand, of course, further investigation. Suffice it for the present to state that × *B. dimidiata* is intermediate in most of its characters between *B. Cosmoides* and *B. sandvicensis.*

Chicago Natural History Museum, Chicago, Illinois.

II. Notes on Schiedea Cham. & Schlecht. (fam. Caryophyllaceae) and Phyllostegia Benth. (fam. Labiatae) in the Hawaiian Islands.

By Earl Edward Sherff

Schiedea Nuttallii Hook. var. **pauciflora** Degener & Sherff, var. nov.—Folia interdum plus minusve oblanceolata. Panicula plerumque tantum 0.6-2 dm. longa, ramis saepius erectis vel suberectis, 1-paucifloris; sepalis capsulisque circ. 4 mm. longis; seminibus maturis ignotis sed immaturis muriculatis.—Specimens examined: *Otto Degener & Amy Greenwell,* ridge behind Papaa, Moloaa Forest Reserve, Isl. Kauai, Jan. 16, 1952 (type, Chi., my photograph no. 4,305: isotypes, Bish.; Chi.; Gray; Kew; N.Y.; Phila.; U.S.).

S. Nuttallii proper is known to me only from the Island of Oahu. Hillebrand (Fl. Haw. Isls. 31. 1888) cited also the islands of Molokai and Kauai. His Kauai material, as previously noted by me in my revision of *Schiedea* (Brittonia 5: 314. 1945), was described by him as having "leaves obovate-oblong; panicle smaller, with fewer divisions, the flowers larger, approaching those of *S. diffusa;* immature seeds only rugose." I have seen none of his Kauai material, but it may well have been the form here named var. *pauciflora* (*cf.* my earlier words, *ibid.,* "There seems a possibility that Hillebrand had before him specimens which were varietally distinct.").

Phyllostegia mollis var. **glabrescens** Deg. & Sherff, *ex* Degener Fl. Haw. fam. 316, Sept. 13, 1935.—In the original description of this variety, the pedicels were described as being densely and suberectly hispid with glandular hairs. For the word *glandular* should be substituted *mostly or at times exclusively eglandular*. A similar correction should be made in my own revision of the genus *Phyllostegia* (Bish. Mus. Bull. no. 136: 43. 1935). A slight modification of the key for *P. mollis* (p. 40) in the same text may then be advised. In the line for the second letter *b*, we may insert after the word *eglandular* the words *or in var. glabrescens sometimes very slightly glandular*.—A large suite of the var. *glabrescens* has recently been collected in Nualele Valley, Isl. Molokai (*Degener & Tam* 22,202, shrubby rain-forest, Mar. 18, 1952) and specimens will soon be distributed to various herbaria.

Chicago Natural History Museum, Chicago, Illinois.

III. Contributions to our knowledge of the genera Tetraplasandra A. Gray and Reynoldsia A. Gray (fam. Araliaceae) in the Hawaiian Islands.

By Earl Edward Sherff

Tetraplasandra pupukeensis var. **megalopoda** Degener & Sherff, f. *trigona* f. nov.—Pedicelli vix breviores, plus minusve deflexo-adscendentes; drupis plerumque trigonis raro tetragonis, stigmatibus plerumque 3 raro 4.—Specimens examined: *Otto Degener* 17,792 *pro parte*, along summit divide toward east of Pupukea-Kahuku Trail, shrubby rain-forest, Isl. Oahu, Dec. 6, 1931 (type, Mo., my photograph no. 4,298).

Degener 17,792 was previously cited (Bot. Leafl. no. 6: 41, 1952) among the specimens of var. *megalopoda*. The stigmas on the few immature fruits present numbered in some cases 4, in others 5. Recently the fine sheet from the Missouri Botanical Garden came to hand, with an abundance (±45) of mature drupes. These were almost uniformly 3-stigmatate and 3-angulate, this being exceptional in *T. pupukeensis*, the varieties of which normally show 4, 5, or 6 stigmas and drupe-angles.

Tetraplasandra Munroi sp. nov.—Arbor foliis (unico viso) ±4 dm. longis (petiolo ±12 cm. longo incluso); foliolis

±9, petiolulo 7-12 mm. longo, lamina coriacea oblongo-ovata usque oblonga vel (pro foliolo terminali) etiam oblongo-obovata, 7-12 cm. longa et 3-6 cm. lata, apice obtusa etiam retusa, basi rotundata usque late cuneata, parce obliqua. Unica umbella visa, haec soluta, semel iterumque composita, demum circ. 1.6 dm. lata, stirpe flexa tenui (3-4 mm. crassa) ±19 cm. longa suffulta; radiis ±20, tenuibus (circ. 0.8-1.5 mm. crassis), acriter angulatis, omnino sine nodis, rectis arcuatisve, 5-6.5 cm. longis; pedicellis plerumque 6-8, tenuibus vel etiam filiformibus, rectis vel saepius arcuatis, acerrime angulatis, demum 11-16 mm. longis. Flores non visae. Drupae maturae siccescentes griseo-brunneae, nunc 3- nunc 4-angulatae, inter angulos profunde lateque sulcatae, 7-10 mm. longae (stylopodio conico parvo et 3 vel 4 stigmatibus inclusis) et 4.5-5.5 mm. crassis.—Specimens examined: *George C. Munro* 694, Kaiholena Valley, central Lanai, Mar. 18, 1922 (type, Bish., my photograph no. 4,172).

The type had been referred interrogatively to *T. lanaiensis* Rock, a species known as yet only from central Lanai. That species is known to me only in the early flowering state but differs in having smaller leaflets, these less blunt at the apex and more gradually narrowed to a more oblique base, their petiolules shorter and broader; the rays (supporting the pedicels) definitely 2- or 3-nodulate and a third or so longer. *T. lanaiensis* has, morever, a mammoth, thrice-compound umbel ±4 dm. broad. *T. Munroi* should be restudied in the field as to flowers and as to the nature of a complete inflorescence. The detached, twice-compound umbel described from the type sheet may, with its elongate stalk, prove to have been possibly just one main part of a thrice-compound umbel that had seemed too large for a herbarium specimen. It is to be hoped that collectors of *Tetraplasandra* hereafter will be especially careful to preserve enough of the complete inflorescence down to and including the nearest leaf-petioles, to permit correct conclusions as to its twice-compound *versus* thrice-compound nature, a most important diagnostic criterion for several species of the genus.

Tetraplasandra meiandra (Hillebr.) Harms, var. **rhynchocarpoides** Degener & Sherff var. nov.—Arbor ±9 m. alta, foliis varietati *rhynchocarpae* mihi valde similis. Inflorescentia sessilis ter umbellata, pedunculis ±5, plus minusve robustis

6-12 cm. longis; radiis ±22, omnibus ad vel unico duobusve 1-3 cm. infra pedunculi apicem positis, 1-1.5 mm. crassis, 3-7 cm. longis, apice 12-20-floris; pedicellis tenuibus, demum 9-13 mm. longis, rectis vel interdum subcurvatis. Drupae submaturae circumambitu laterali deltoideo-ovatae, basi truncatae, calice circ. 5.5 mm. alto et inferne circ. 0.5 mm. crasso, stylopodio conico elongato rhynchoideoque circ. 3.5 mm. longo 3 vel 4 stigmatibus inclusis. — Specimens examined: *Otto Degener* 21,787, tree 30 ft. tall, overtopping forest at 2,000 ft., Kulani Prison Road, Isl. Hawaii, Feb. 5, 1952 (type, Chi., my photograph no. 4,303: isotypes, Berl.; Bish.; Del.; Gray; Kew; Mo.; N.Y.; Par.; Phila.; U.S.).

A sister variety to var. *rhynchocarpa* (likewise of southeastern Hawaii). It differs, however, in having more numerous (±22, not ±9), slender (1-1.5 mm., not 2-3 mm. thick) rays, slender not thickish pedicels, these 12-20- not ±10-flowered, and drupes much smaller, their calycular portion ±5.5 mm. not 12-14 mm. tall.

Tetraplasandra meiandra (Hillebr.) Harms, var. **polystigmata** var. nov.—Folia usque ad 3.5 dm. longa, petiolo 7-11.5 cm. longo; petiolulis (5-) 10-20 mm. longis; lamina coriacea supra reticulate depresso-venulosa, ovali-oblonga usque oblonga vel ovata, apice truncata etiam emarginata usque rotundata subacutave etiam subacuminata, basi obliqua truncata usque rotundata, 6-12.5 cm. longa et 4-7 cm. lata. Inflorescentia sessilis, ter umbellata, pedunculis ±5, ±11 cm. longis, tenuibus; radiis 10-20 terminalibus vel 1-3 inferius positis, ±3.5 cm. longis; pedicellis circ. 6-8, tenuibus, demum 1-1.5 cm. longis. Drupae globoso- vel urceolato-ovoideae, calice circ. 7-8 mm. longo, apice exserto-conico et 2-3 mm. longo 5 vel interdum 6 stigmatibus inclusis.—Specimens examined (all from **EAST MAUI**): *Otto Degener* 17,785, Opuola Stream in vicinity of ditch trail, Jul. 7, 1927 (topotype, N.Y.); *Degener* 17,786, forest, Pipe-Line Trail, Olinda, Jul. 16, 1927 (N.Y., my photograph no. 4,288); *Joseph F. Rock* 12,508, Honomanu Trail, Haleakala, May, 1911 (type, Gray, my photograph no. 4,286: isotype, Bish.); *Carl Skottsberg* 878, Kula Pipe-Line, Haleakala, alt. about 1,200 m., Oct. 18, 1922 (Bish., my photograph no. 4,287).

Closely allied to the var. *ovalis* of the same region but having larger and mostly more veiny leaflets, commonly 5 or 6 not 4 stigmas, 6-8 rather than 9-14 florets to an umbellet, etc.

Tetraplasandra meiandra (Hillebr.) Harms, var. **hailiensis** Degener & Sherff, var. nov.—Folia usque ad ±4 dm. longa, petiolo 5.5-10 cm. longo, foliolis 7-9, petiolulis 5-15 mm. longis, lamina oblonga vel saepius ovali-oblonga vel ovata, apice obtusa usque subacuta, basi obliqua plerumque truncata usque late rotundata, coriacea, supra reticulate depresso-venulosa, usque ad 11 cm. longa et ad 7.5 cm. lata. Inflorescentia sessilis vel subsessilis, ter umbellata; pedunculis ±4, circ. 8-10 cm. longis et 3-5 mm. crassis; radiis terminalibus vel unico inferius posito, circ. 12-16, subrobustis, saepius 4-7 cm. longis; pedicellis 8-12, subrobustis, 9-16 mm. longis. Flores non visi. Drupae globoso-prismaticae, siccae valde tetra- vel interdum pentagonae, calice 7-8 mm. longo, stylopodio depresso-conico sub 2 mm. alto, stigmatibus 4 vel interdum 5.—Specimens examined: *Otto Degener* 18,016, decadent forest, top of Haili Gulch, Isl. Oahu, Nov. 28, 1931 (type, 1st sheet, N.Y., my photograph no. 4,283; 2nd sheet, U.S., my photograph no. 4,284: isotypes, Mo., 2 sheets; N.Y.); *Degener* 18,247, about 4 dying trees in dryish, decadent forest, top of Haili Gulch (Makua vicinity), same date (Mo., my photograph no. 4,285).

Tetraplasandra kauaiensis (H. Mann) comb. nov.; *Heptapleurum kauaiense* H. Mann, Proc. Amer. Acad. 7: 168. 1867; *Agalma kauaiense* Seem. Journ. Bot. 6: 103. 1868; *Pterotropia kauaiensis* (H. Mann) Hillebr. Fl. Haw. Isls. 150. 1888; *Dipanax kauaiensis* (H. Mann) Heller, Minnesota Bot. Studs. 1: 871. 1897. This and the next four *taxa* have been referred by most students of the Hawaiian flora to *Pterotropia* Hillebr., a genus untenable because of the earlier *Dipanax* of Seemann (*cf.* Heller, *loc. cit.* 870). A monographic study of *Tetraplasandra*, however, reveals so much interlocking or overlapping of characters between *Tetraplasandra* and these few *taxa* as to remove all warrant for their segregation.*

Tetraplasandra A. Gray sect. **Pterotropia** (H. Mann) comb. nov.; *Heptapleurum* Gaertn. sect. *Pterotropia* H. Mann, Proc. Amer. Acad. 7: 168. 1867; *Pterotropia* (H. Mann) Hillebr. Fl.

*Even Dr. Otto Degener, who used *Pterotropia* in his Flora Hawaiiensis (fam. 281. Aug. 24, 1938), became skeptical of its validity as a genus apart from *Tetraplasandra*. In a letter to me dated Oct. 4, 1950, he wrote: "I am on the fence as to whether *Pterotropia* should remain in existence." Later (Apr. 20, 1952), he wrote: "*Tetraplasandra* ..... quite likely should include *Pterotropia* (or *vice versa*)." (Of course, there can be no "*vice versa*" in this case, since the name *Tetraplasandra* antedates the name *Pterotropia*.)

Haw. Isls. 149. 1888.—Harms (*in* Engler & Prantl, Nat. Pflanzenfam. 3: 8: 29 and 30. 1898) erected two sections for the genus *Tetraplasandra* as defined by him, *viz.*, *Eutetraplasandra* and *Nothotetraplasandra*. With the merging, however, of the species of *Pterotropia*, regarded by Hillebrand as constituting a separate genus, with the genus *Tetraplasandra*, the name *Pterotropia* automatically becomes valid as a sectional name, because of its use by Mann for a section of *Heptapleurum* in 1867. The type of the section *Pterotropia* is *Tetraplasandra kauaiensis*. A full list of the *taxa* referable to the section must be deferred, however, until the appearance of my revisional monograph of *Tetraplasandra* as the genus occurs in the Hawaiian Islands.

Tetraplasandra kauaiensis var. **dipyrena** (H. Mann) comb. nov.; *Heptapleurum dipyrenum* H. Mann, Proc. Amer. Acad. 7: 168. 1867; *Dipanax Mannii* Seem. Journ. Bot. 6: 141. 1868; *Pterotropia dipyrena* (H. Mann) Hillebr. Fl. Haw. Isls. 150. 1888; *Dipanax dipyrena* (H. Mann) Heller, Minn. Bot. Studs. 1: 870. 1897.

H. Mann *(loc. cit.)* described two purportedly new species of *"Heptapleurum;"* first, *H. kauaiense* and, second, *H. dipyrenum*. Hillebrand *(loc. cit)* tried to preserve these as species in his proposed new genus, *Pterotropia*. For *P. dipyrena* he described the leaflets as "cordate at the base," the "drupe ringed about the middle or above," and the "stigmas 3, or 2 or 4, sessile and discreet on the conical disk or slightly raised." For *P. kauaiensis* he described the leaflets as "rounded at the base," the drupe "ringed at or below the middle," and the "ovary [the cells of which normally match the stigmas in number] generally 4-celled, or 3-5-celled."

With the subsequent discovery of several new varieties intermediate between Mann's two *taxa*, it has become obvious that Mann's *H. dipyrenum* must be considered as a mere variety of *H. kauaiense*, that is, of *Tetraplasandra kauaiensis* of the present text.*

Tetraplasandra micrantha nom. nov.; *Pterotropia kauaiensis* var. Hillebr. Fl. Haw. Isls. 151. 1888; *Pterotropia kaalae* Skottsb. Meddel. Göteb. Bot. Trädg. 10: 151. 1936.

*Some four decades ago, Rock (Indig. Trees Haw. Isls. 357. 1913) wrote: *"Pterotropia kavaiensis* [*sic*], in the writer's mind, should be united with *P. dipyrena*, but as only one good flowering specimen from one locality is at present in his possession, he defers such action until the future, when more complete material shall be at hand."

Tetraplasandra gymnocarpa (Hillebr.) comb. nov.; *Pterotropia gymnocarpa* Hillebr. Fl. Haw. Isls. 150 and 151. 1888; *Dipanax gymnocarpa* (Hillebr.) Heller, Minn. Bot. Studs. 1: 870. 1897.

Tetraplasandra kauaiensis robustior var. nov.—Inflorescentiae rami ramulique duplo crassiores, umbellulis florescentibus dimidio latioribus, floribus majoribus petalis lanceolatis circ. 6 mm. longis. Drupae circumambitu late oblongae, circ. 12 mm. altae et circ. 10 mm. crassae, apice obtuse rotundatae, stylopodio brevissimi, stigmatibus plerumque 5 raro 4.—Specimens examined: *Cranwell, Selling, & Skottsberg* 3,095, Kokee, Isl. Kauai, Aug. 25, 1938 (Bish.; Goth.); *Otto Degener & Henry Wiebke* 2,180, large trees in open forest with much precipitation, Kokee, Isl. Kauai, June 23, 1926 (Univ. Calif.; Calif. Acad.; N. Y., 4 sheets); *Amos Arthur Heller* 2,884, large tree, 30-40 ft. tall, with soft wood, on the brow of the plateau, at an elevation of about 3,500 feet, above Kaholuamanu, Isl. Kauai, Oct. 16, 1895 (type, Bish., my photograph no. 4,337: isotypes, Arn., my photograph no. 4,338; Univ. Calif.; Chi.; Corn.; Gray; Mo., 2 sheets; Phila.; U.S.); *L. H. MacDaniels* 800, height 25 m., open forest, alt. 1,300 m., Kokee, Isl. Kauai, Feb. 18, 1927 (Bish.); *Carl Skottsberg* 1,010, near Kokee ranger station, Isl. Kauai, Oct. 28, 1922 (Goth.).

Typical *T. kauaiensis* is found on Kauai at Halemanu, drier districts below Kaholuamanu, and (type locality) at 2,000-3,000 ft. altitude, Waimea. It is replaced at Kokee and on the brow of the plateau above and northeast of Kohaluamanu with the var. *robustior*.

Tetraplasandra kauaiensis koloana var. nov. — Foliola ±9, lamina anguste oblonga usque late ovata, interdum 1.8 dm. longa et 1.1 dm. lata, lateralia apice plus minusve obtusa, basi obliqua et rotundata vel subtruncata. Pedunculi ±3, patentes, ±17 cm. longi; radiis tenuibus, saepius 4-6 cm. longis; pedicellis circ. 8-12 in umbellula terminali dispositis, tenuibus, 11-16 mm. longis. Stigmata plerumque 6 raro 7; drupis immaturis, apice conico sed lateraliter concavo ±3.5 mm. alto, stylopodio vix 0.5 mm. alto.—Specimens examined: *Charles Noyes Forbes* 276-*K*, tall tree, Wahiawa Mountains, Koloa District, Isl. Kauai, August, 1909 (2 type sheets, Bish., my photographs no. 4,339 and no. 4,340).

Tetraplasandra kauaiensis intercedens var. nov. — Foliola ±13-19, lamina plerumque oblonga, lateralia apice acuta acuminatave basi truncata vel parce cordata. Inflorescentiae pedunculi 4-6 umbellate congregati saepe 3-3.5 dm. longi, radiis tenuibus usque ad ±8 cm. longis; flosculis paucis (4-10) in umbellula dispositis aliis secundum radium racemosis, pedicellis ad anthesin circ. 2-3 mm. demum circ. 4-5.5 mm. longis. Drupae globoso-ovoideae, circ. 9-10 mm. altae (stylopodio ±1 mm. longo et plerumque 3 raro 2 stigmatibus inclusis), calicis limbo supra medio anulatae, vertice hemisphaerico vel tumido-conico.—Specimens examined: *Charles N. Forbes* 1,973-*M*, 80 feet tall, trunk 2 ft. in diam., only about 14 trees seen, 30-40 ft. average height, Auwahi, East Maui, Mar. 15, 1920 (topotypes, Bish.; Calif Acad.); *Forbes* 2,169-*M*, common in the dying forest, 30-35 ft. tall, straight trees, trunk 6-8 inches diam., bark smooth and gray, umbellately branched or nearly so at top, slope of Haleakala, Kula side, East Maui, Apr. 8, 1920 (Bish., 2 sheets, Univ. Calif.; Par.; U.S.); *William Hillebrand*, East Maui (U.S.); *Joseph F. Rock*, 8,641, a very tall tree, alt. 3,000 ft., dry districts, Auwahi, southern slopes of Mt. Haleakala, East Maui, Nov. 12, 1910 (type, Bish., my photograph no. 4,318: isotypes, Arn., 4 sheets; Univ. Calif., 2 sheets; Goth.; Gray, my photograph no. 4,319; U.S., 2 sheets).

In this variety are found the few (3 or sometimes 2) stigmas characteristic of most var. *dipyrena* material combined with the possession of a distinct stylopodium as found in var. *kauaiensis* (hence "*intercedens*"). It is the *Pterotropia dipyrena* of Rock's illustrations (Indig. Trees Haw. Isls. plates 144 and 145. 1913), based upon his collections on the *southwestern* (his "southeastern" was an error!) "and strictly southern slopes of Mt. Haleakala."

Tetraplasandra kauaiensis nahikuensis var. nov. — Foliola oblonga vel interdum ovato-oblonga etiam ovata, lamina saepe 1.5-1.8 dm. longa et 8-10 cm. lata, apice plerumque acuminata, basi obliqua et rotundata usque truncata, petiolulo usque ad 2.5 cm. longo. Inflorescentia magna, pedunculis demissis ±4 dm. longis, radiis tenuibus 4-10 cm. longis irregulariter alternis et paucis terminaliter umbellatis; pedicellis 5-12 mm. longis, moderate tenuibus, 5-8 in umbellula terminali paucis aliis racemose dispositis. Petala 4-5 mm. longa. Drupae

ovoideae, calicis limbo ad vel paulum infra medium anulatae, apicaliter conicae, sine stylopodio distincto, circ. 8-9 mm. altae, stigmatibus nunc 3 nunc 4.—Specimens examined: *Charles N. Forbes* 239-*M*, large tree, 35 ft. tall, Nahiku, East Maui, July, 1910 (topotype, Bish.); *Joseph F. Rock*, Nahiku, Jan. 14, 1909 (topotypes, Bish., 2 sheets, my photograph no. 4,325); *Rock*, Nahiku, May, 1911 (topotypes, Arn., 2 sheets); *Rock*, Nahiku, May 10, 1911 (type, Arn., my photograph no. 4,324: isotypes, Gray, 2 sheets); *Rock* 8,641*a*, Nahiku, Jan. 1-8, 1909 (topotypes, Bish., 3 sheets); *Rock* 12,510, alt. 2,000 ft., Nahiku, April, 1911 (topotypes, Bish., 3 sheets; Univ. Calif.; Gray, 2 sheets; U.S.).

Rock (Indig. Trees Haw. Isls. 359. 1913) treated this and the tree named var. *intercedens* above as *Pterotropia dipyrena*. Var. *intercedens* (from southern and southwestern East Maui) has the drupes anulate (with the calyx-limb) *above* the middle, the upper part *swollen-conic or hemispherical*, the *3 or rarely 2 stigmas on a definite stylopodium;* pedicels at fruiting *about 4-5.5 mm. long*. Var. *nahikuensis* (from northeastern East Maui) has the drupes anulate *at or a little below the middle*, the upper part *conic*, the *stigmas 3 or as often 4*, a *definite stylopodium lacking;* pedicels at fruiting *5-12 mm. long*.

Tetraplasandra kauaiensis grandis var. nov. — Foliola majora, lamina saepe 2 dm. longa, saepe 7-11 cm. lata, oblonga usque (inferiora) ovata, apice obtusa usque acuminata, basi obliqua et truncata usque cordata, supra (saltem sicca) saepe plus minusve glauca, infra plus minusve glabrescentia; petiolulis medianis 4-8 mm. imis 1.5-3 cm. longis. Panicula maxima saepe fere 1 m. longa, rhachi interdum 1.5 dm. longa, pedunculis 5-7.5 dm. longis; radiis numerosis (±15-20 racemose secundum pedunculum et ±7-9 umbellate ad pedunculi apicem positis), usque ad ±9 cm. longis; pedicellis tenuibus plerumque 9-16 in umbellula terminali et 3-6 irregulariter secundum radium positis, demum 7-13 mm. longis. Petala 6-8, lanceolata usque ovato-triangularia, ad anthesin 6-8 mm. longa; staminibus 6-8. Drupae plerumque trigonae aliter anguste ovatae, anulatae supra medium, supra anulum (calicis limbum) mitriformes, apice stylopodio minimo obsoletove et 3 vel rarius 2 stigmatibus instructae.—Specimens examined: *Joseph F. Rock* 10,019, alt. 2,000 feet, dense Hilea forest, gulch from Kanolohu to Kumanua, Kau, Isl. Hawaii, Jan. 17,

1912 (type, Gray, my photograph no. 4,320: isotypes, Arn., 7 sheets, my photographs no. 4,321, no. 4,322, and no. 4,323; Bish.; Univ. Calif., 3 sheets; Gray, 3 sheets; Par., 2 sheets).

Related to this variety is a tree found in easternmost Hawaii: *Carl Skottsberg* 1,125, lava field west of Pahoa, Sept. 9, 1922 (Bish.; Goth.). I have seen two leaves only; these glabrous on both surfaces, 9-foliolate, the leaflets with faintly sinuate margins. Flowers and fruits are much to be desired.

Tetraplasandra gymnocarpa megalocarpa var. nov.—Foliola saepe 6-7 cm. lata, basi valde obliqua. Pedunculi (inflorescentiae rami primarii) ±3.5 dm. longi; radiis (ramis secundariis) tenuissimis, elongatis (saepe 10-13 cm. longis); pedicellis elongatioribus, demum saepe 1.5-2.5 cm. longis. Petala ±6, lanceolata vel laneolato-linearia, 6-8 mm. longa; staminibus ±6. Drupae ovoideae, 11-14.5 mm. altae, stigmatibus nunc 3 nunc 4 rarissime 2, stylopodio absenti.—Specimens examined: *Degener, Park, Bush, Potter, & Topping* 11,921, rainforest, summit of Koolau Range beyond Pig-God Trail, Punaluu, Isl. Oahu, Jul. 4, 1935 (topotypes, Bish., my photograph no. 4,334; Corn.; Del., 2 sheets; Mo., 2 sheets; U.S.); *Joseph F. Rock & Gerret P. Wilder* 8,827, alt. 2,000 feet, in one of the inner gulches of the Koolau Mts., Punaluu, August, 1911 (type, Gray, my photograph no. 4,332: isotypes, Arn., 4 sheets, my photograph no. 4,333; Bish.; Gray, 2 sheets; U.S.); *Olof H. Selling* 3,671, Koolau Mts., Punaluu, Sept. 27, 1938 (topotype, Bish.).

Tetraplasandra gymnocarpa leptocarpa var. nov. — Foliola ±11, lamina plus minusve oblonga vel (3 terminalia) oblongo-oblanceolata, apice acuta usque subacuminata, basi obliqua rotundataque, infra aegre pulverulento-furfuracea, petiolulis tenuibus et rhachi glabrescentibus. Inflorescentia glabrescens, rhachi ±16 cm. longa, ramis dictis pedunculis ±20-23 cm. longis, umbellate congregatis; ramulis dictis radiis 4-6 ad pedunculi apicem et usque ad 4 irregulariter sed remote secundum pedunculum positis, tenuibus, 4-6 cm. longis. Flosculi non visi. Drupae paucae (1-4) in umbellula terminali congregatae, prismaticae, 4-5-gonae, apicem versus conicae vel mitriformes, apice plerumque 2- raro 3-stigmatatae, 13-15 mm. altae, sub 5 mm. crassae, stylopodio absenti; pedicellis 10-15 mm. longis. — Specimens examined: *Charles Noyes Forbes* 1,608-*O*, trail between Konahuanui and Olympus, Isl.

Oahu, November, 1910 (type, Bish., 2 sheets, my photographs no. 4,330 and no. 4,331).

Tetraplasandra turbans sp. nov.—Arbor ramulis albida pulverulentaque, foliis ±5 dm. longis (petiolo minutissime pulverulento-hispidulo circ. 11-12.5 cm. longo et ±6 mm. crasso incluso); foliolis circ. 17-19, apice acutis usque fere acuminatis, basi obliquis et truncatis usque subcordatis, coriaceis, supra glabris, infra plus minusve dense stellato-furfuraceis, imis deltoideo-oblongis lamina ±5.5 cm. longis et ±3 cm. latis, aliis anguste usque moderate oblongis lamina 7-10.5 cm. longa et 2.5-3.5 cm. latis; petiolulis 1-5 mm. longis, pulverulento-furfuraceis; rhachi plus minusve glabrescenti. Inflorescentia furfuracea ut videtur normaliter (unica completa visa) rhachin ±4 cm. longam et ±7 mm. crassam terminans, umbellate 5-ramosa; ramis patentibus tenuibus (±3 mm. crassis) 12-15 cm. longis et cicatricosis, apicem versus circ. 10-15-ramulatis; ramulis minimis tantum ±1 cm. longis, cicatricosis, ad propeque cacumen confertissime flosculatis, 10-16 flosculis plurimum in umbellula tantum 7-9 mm. crassa congregatis. Pedicelli sub 1 mm. longi. Calyx basalis, discoideus; corolla (vix matura) globoso-ovoidea, circ. 3 mm. alta, 7-8-angulata; petalis cohaerescentibus et staminibus 7 vel 8. Unica drupa valde immatura visa; pedicello 3.8 mm. longo; corpore (ovario e calice basali perfecte libero) tetragono (circumambitu obovoideo) 4.5 mm. alto et ±3.5 mm. crasso, apice concavo-truncato limbo parvo marginali coronato; stigmatibus 4, sessilibus.—Specimens examined: *Charles Noyes Forbes*, Makaha Valley, Kaala Range, northwestern part of Oahu, Feb. 12-19, 1909 (2 type sheets, Bish., my photographs no. 4,335 and no. 4,336: isotypes, Univ. Calif.; Par.).

Forbes had labeled his collection *Pterotropia kauaiensis* var. β. Hbd., named *Tetraplasandra micrantha* above. In *T. micrantha*, the calyx, it is true, is similar at anthesis to the calyx here, but rapidly elongates upward in early fruit so as to be adnate nearly or fully half-way up the ovary; in *T. turbans*, on the other hand, the calyx remains discoid at the bottom of a completely superior ovary in the maturing drupe, much as in *T. gymnocarpa*. In both species, the leaflets are very furfuraceous beneath with myriads of tiny, whitish, stellately setulose scales, but the leaflets of *T. micrantha* are thinner and attain a length and breadth nearly twice as great. More-

over, in *T. micrantha* the inflorescence is much larger, its rhachis often 3 dm. long; the florets are many fewer (only about 8-10 in a lone terminal umbellet, with several florets placed singly 1-3 cm. lower down on the flowering-branchlet) and on slender pedicels becoming 5-6 mm. long in early fruits (ripe fruits not seen).

Much to be desired are mature drupes. The description of an immature drupe rests for the present on the one found in the packet accompanying an isotype (Univ. Calif.). The thin, shallow, coroniform limb at the apical margin is a perplexing or disturbing character (whence *"turbans"*), in that it simulates a calyx-limb and thus falsely suggests an inferior ovary.

Reynoldsia mauiensis Sherff, var. **macrocarpa** Degener & Sherff, var. nov.—Foliola basi saepe valdius cordata. Inflorescentia (tantum unica visa) forsitan paulo minor atque minus ramosa (ramis pro typo 9); pedicellis 4-9 mm. longis; drupis immaturis siccis viridi-brunneis, calice circ. 6-6.5 mm. alto et 4.5-5 mm. crasso.—Specimens examined: *Otto Degener* 21,977, in *aa kipuka*, along main road northeast of Kanaio, East Maui, Feb. 27, 1952 (type, Chi., my photograph no. 4,270: isotype, Chi.).

Reynoldsia Hosakana Sherff, Bot. Leafl. no. 6: 18. 1952.—The type specimen of this species (*Hosaka* 1,334) came from a tree 30 ft. tall, observed on a wooded gully slope, alt. 1,300 ft., Haili Gulch, Kaena, Isl. Oahu, Feb. 2, 1936. On March 2nd, 1952, Mr. Hosaka revisited the type locality and collected material of what he assumed to be my as then proposed new species, *R. Hosakana*. He reported by letter that the florets were odorless and the petals were light yellow to yellowish-green, and these characters were thereupon incorporated by me in the pending original description of *R. Hosakana*. However, his suite of specimens (his no. 3,651) has come to hand since then and proved to be of the very different *R. sandwicensis* var. *intercedens*.* We must, therefore, await a rediscovery of a living tree of the exceedingly rare but very unique *R. Hosakana* before being able to report upon the true color of or the presence of odor in the petals.

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*Mr. Hosaka returned to the same locality April 20th, 1952, and collected a larger suite of specimens from a tree at a lower altitude. These, too, are *R. sandwicensis* var. *intercedens*.

IV. Further notes on the genus Bidens L. (fam. Compositae) in Tropical East Africa.

By Earl Edward Sherff

Bidens incumbens Sherff, var. **muthicola** var. nov.— Achaenia matura linearia, marginata sed non vere alata, valde obcompressa, marginibus costa medianaque acriter subrecteque setulosa, corpore demum 10-11 mm. longa, apice conspicue biaristata aristis gracillimis plerumque valde divaricatis circ. 3-3.3 mm. longis basim versus gracillime antrorsumque 1-3-hamatis alibi gracillime retrorsumque paucihamatis.— Specimens examined: *P.R.O. Bally B.*1,655, alt. 1,500 ft., Mutha Hill, Kenya Colony, Feb. 25, 1942 (type, E. Afr., my photograph no. 4,300).

The type of *B. incumbens* (*Miss Napier* 1,016) came from Voi of extreme southeastern Kenya Colony (and ±190 km. southwest of Mutha Hill). It had only very immature achenes. These were now 2- now 3-aristate; the aristae very slender, elongate-filiform, naked or more rarely 1- or perhaps 2-barbed with erect setae near their base. Some doubt even was expressed as to whether mature achenes might not have wings and compel reference to *Coreopsis* instead of *Bidens*. Fortunately, the type of the present variety, with its abundant mature, exalate achenes and mostly retrorse aristal barbs, confirms clearly the membership in *Bidens*. The general habit of var. *muthicola* seems identical with that of the species proper, both as to leaves and as to the corymbose inflorescence. One of the two sprays on the type sheet has about 25 capitula. The ligulate florets number 8, the flowering capitulum is ±3.3 cm. broad and ±1.1 cm. tall, and the spreading to reflexed external involucral bracts are 5-8 mm. long. The achenial bodies easily exceed the paleae and the divaricate aristae are noticeable (the fruiting heads offering a strong resemblance to those of *B. reptans* (L.) G. Don, *B. squarrosa* H.B.K., and other members of the section Greenmania of the Western Hemisphere).

In my monograph of the genus *Bidens* (Bot. Ser. Field Mus. Nat. Hist. vol. 16. 1937), the var. *muthicola* will key down to p. 65, letter *g*, 2nd *h*, 1st *i*, and 1st *j* thereunder, where it will stand next to *B. gracilior*. That species differs at once in the much smaller height of its plants (4-7 dm., not ±2.5 m.), its smaller achenes (body 4.5-6 mm. long and 0.6-1

mm. wide), their tops bald or but shortly (0.2-0.3 mm.) aristate, their aristae nude or only 1- or 2-barbed, etc.

Bidens Grantii var. **Stapfii** Sherff, Bull. Jard. Bot. Brux. 13: 287. 1935.—This variety seems to have been known hitherto only from the type locality, namely, alt. 4,100 ft., District of Buddu, Uganda, East Africa. A specimen sent me by P. J. Greenway, Esq., was collected at the Victoria Nile River some 35-40 km. above Lake Albert: *Lady Muriel G. Blake*, "Murchinson" (Murchison) Falls, Uganda, *commun.* Jan. 22, 1951 (E. Afr., herb no. 10,083).

Bidens microcarpa Sherff.—Here belongs a recent specimen from Tanganyika: *H. Van Rensburg* 451, herb about 2 ft. tall, along mountain-path in open woodland and grassland, Mpwapwa, Central Province, June 16, 1949 (E. Afr.). Normally, *B. microcarpa* has achenes erect-setose at and just beneath their apex. The *Van Rensburg* material has the achenes entirely glabrous.

Bidens meruensis Sherff, Bot. Leafl. no. 5: 18. 1951.—P. J. Greenway, Esq., Botanist-in-charge at the East African Herbarium (Nairobi, Kenya Colony) recently sent on loan some specimens of Coreopsideae for my study, and among these is an additional sheet of *B. meruensis: Guy Babault B.* 1,439, Mt. Meru crater, Tanganyika Territory, January, 1941 (my photograph no. 4,301). The sheet bears two sprays, one with a lone capitulum, this in the late-flowering stage, the other with two capitula, one of these with submature achenes (their body about 6 mm. long). Since the species has been known till now only from the meagre and somewhat unrepresentative type specimen collected at Meru by Van Someren, we may note the following: The largest peduncle present is 14 cm. long, and from 1.5 mm. (near top) to 2.5 mm. (near base) thick. Certain leaves when old are dark, somewhat coriaceous and glossy above, with areas here and there glabrescent. The largest leaves present (±7.5 cm. long) are 2-3-pinnatisect, their two lowermost leaflets about 5 cm. long and 2-2.5 cm. wide. The outer involucre has ±14 bracts, somewhat biserially disposed and with an extreme spread of ±3.5 cm. in age. The ray-corollas are about 3.5 cm. long. At the time of writing my original description of *B. meruensis (loc. cit.)*, I interpolated

for the type locality, Meru, the words "just west-southwest of Mt. Kilimanjaro, extreme northeastern Tanganyika." Mr. Greenway, in his letter of Apr. 3, 1952, states: "This is not so; it is the Meru on the northeast side of Mt. Kenya a little north of the 0° line" [thus about 500 km. northeast of the Meru in Tanganyika, where Babault collected].

Bidens superba Sherff, var. **angustifolia** var. nov. — Folia superiora (alia non visa) fere sessilia, 7-14 cm. longa et supra medium (ubi tantum 3.5-6 mm. lata) usque ad apicem acerrimum sensim angustata, ad basim irregulariter sed conspicue acerrimeque elongato-dentata (dentibus 2-4 pro utroque latere saepius antrorsum flexis et seta terminali exclusa usque ad 1.6 cm. longis), infra praecipue marginibus venisque antrorsum spinuloso-hispidula. Inflorescentiae ramuli sparsim usque dense antrorso-hispiduli. Achaenia matura ignota.— Specimens examined: *J. W. Purseglove P.*3,550, herb 3 ft. tall, grassland, alt. 5,000 ft., Ruhinda, North Kigezi, southwesternmost Uganda, January, 1951 (type, E. Afr., my photograph no. 4,299).

Bidens nobilioides sp. nov.—Herba (sine dubio perennis) habitu praecipue ramulis foliisque *Bidenti nobili* mihi valde similis sed vix fruticosa et tantum 9-12 dm. alta. Ramuli graciles, brunnei usque purpurei, glabri vel secundum paucos sulculos hispiduli, internodiis 3-5 cm. longis. Folia principalia 4.5-6 cm. longa (petiolo tenui marginatove glabro ciliatove 3-10 mm. longo incluso); lamina circumambitu deltoidea, vix bipinnatisecta, segmentis primariis lateralibus 2 vel 3 jugis, omnibus linearibus vel cuneato-linearibus, integris vel irregulariter sectis, glabris, 2-3 cm. longis, terminaliter attenuatis et acriter apiculatis, marginaliter indurato-revolutis, terminali (dentibus exclusis) plerumque 1.5-2.5 mm. lato. Capitula (4 pro unica inflorescentia visa) corymbose disposita, radiata, pansa ad anthesin 2.2-2.8 cm. lata et ±7 mm. alta, pedicellis tenuibus pubescentibus tantum circ. 1 cm. longis. Involucri bracteae exteriores 8-10, lineares, conspicue purpureo-lineatae, extus glabrae, marginibus ciliatae, apice obtuso minutissime mucronatae, circ. 5-6 mm. longae, quam interiores lanceolato-ovatae extus fere glabrae apice puberulentae marginibus flavo-diaphanae alibi purpureae, paulo breviores. Flores ligulati 5 vel 6, flavi, circ. 1.1 cm. longi, ligula late oblanceolata, apice

truncato-emarginata et obsolete denticulata. Achaenia matura ignota. Ovaria plana, glaberrima, exaristata, oblanceolato-oblonga, tantum 0.5-0.9 mm. longa, apice atro-purpurea alibi diaphana usque ad straminea.—Specimens examined: *P.R.O. Bally B.*5,616, herb 3-4 ft. tall, forest edge on mountaintop, Mt. Kubal, Kenya Colony, Oct. 10, 1947 (type, E. Afr., my photograph no. 4,302).

The type, though noted by the collector as an herb, is rather woody near the base. *Bidens nobilis* of Tanganyika Territory, of similar foliage aspect, is said to be a branched shrub growing 1.8-3.6 m. tall; its capitula are ±6 cm. wide at anthesis and ±1.2 cm. tall, the outer involucral bracts somewhat hispidulous, the ligulate florets about 2.5 cm. long; its ovaries are erect-setose at apex and margins, also biaristate with aristae 1-1.5 mm. long.

In my monograph of *Bidens* (Bot. Ser. Field Mus. vol. 16. 1937), *B. nobilioides* will key down to the second letter *j* under the second letter *i* on page 68. Its dorsally glabrate (but ciliate) outer involucral bracts place it with the first letter *k* thereunder, but it differs from the two species (*B. Kirkii* and *B. ambigua*) given under that *k* by having, among other characters, 8-10 (not 3-5) outer involucral bracts.

Chicago Natural History Museum, Chicago, Illinois.

V. Munroidendron, a new genus of Araliaceous trees from the Island of Kauai.

By Earl Edward Sherff

Munroidendron gen. nov. (fam. Araliaceae, subfam. Scheffleraeae Harms *in* Engl. & Prantl, Nat. Pflanzenfam. 3: 8: 23. 1898).—Arbores, cortice laevi griseoque, foliis pinnatis petiolatisque plus minusve incano-tomentulosis vel stellato-furfuraceis, foliolis integris. Inflorescentia pendula, vere racemosa, sine umbellulis, omnino stellato-furfuracea, numerosissime (±100-) flosculata; pedicellis alternis (raro paucis subverticillatis) secundum rhachin ipsam dispositis, basi bractea minima acerrima patenti reflexave concava plerumque persistente instructis, ad calicem non articulatis. Calyx ad ovarium adnatus, sepalis inter se conjunctis. Petala ±6 primum coalita demum separata reflexaque, intus valde costulata. Stamina diverse 10 vel 15 vel 15-20 (raro tantum 5)

in unico circulo disposita. Ovarium 12-14-loculatum, stylopodio conico, stigmatibus 12-14 minimis vix distinctis. Fructus drupaceus. Type, *Munroidendron racemosum* infra.

Munroidendron racemosum (Forbes) comb. nov.; *Tetraplasandra racemosa* Forbes, Occas. Paps. Bishop Mus. 6: no. 4: 51-54, fig. 10. 1918.—A tree 6-7 m. (not "dm." as printed in Forbes, *loc. cit.*) tall, with straight trunk, clothed with smooth, gray bark and crowned with spreading branches. Leaves crowded, with clasping petioles, imparipinnate with 5-9 leaflets, mealy-tomentulose, rhachis 1.8-2.6 dm. long; leaflets sessile or nearly so on short, thick petiolules up to 5 mm. long, thinnish, cordate or cordate-oblong or the terminal and often the upper pair oval to elliptic, obtuse to barely acuminate at apex, lateral ones basally oblique, all of them bright green and sprinkled with stellate-furfuraceous tomentum above, pure white (in herbarium specimens tawny) and densely stellate-furfuraceous beneath, the blade 5.5-10 cm. long and 3.3-6.4 cm. wide. Inflorescence a slender, terminal, and (even when very young) strictly pendulous raceme, stellate-furfuraceous throughout, 2.5-6 dm. long; the stout or stoutish (basally up to 8 mm. thick) rhachis abundantly floriferous from its tip to nearly its attachment, becoming in age covered with tiny, somewhat diamond-shaped, sunken scars (from the detaching of the pedicels), these commonly accompanied proximally with a minute, subulate, concave or involute bract barely 1 mm. long. Pedicels 4-6 mm. long, reflexed, alternate or rarely a few subverticillate, never grouped in umbellets. Calyx cylindric, with truncate limb, becoming strongly costate on drying, white-mealy-tomentose, 7 mm. tall. Corolla 16-20-costate on the inside, breaking into 5 or 6 petals, these strongly 2-5-ribbed on the glabrous and yellowish inner face, white-mealy-tomentose on the outer face, strongly reflexed at anthesis, 9 mm. long. Stamens 10-20 (rarely only 5), in a single circle, recurved. Ovary 12-14-celled, crowned at the deep-red apex by a conical stylopodium, this with 12-14 minute, deep-red, scarcely distinct stigmas at its top. Drupe ovoid, 1 cm. tall and 9 mm. thick.—Specimens examined: *Charles Noyes Forbes* 595-*K*, Nonou Mountains, eastern (slightly northeastern) Kauai, Oct. 16-17, 1916 (isotypes, Mo., 2 sheets, my photographs no. 4,183 and no. 4,184).—According to Forbes *(loc. cit.)*, "about a dozen trees were seen at the type

locality, usually occurring as individuals in separated localities."

Forbes remarked further: "This species differs from all known Hawaiian *Araliaceae* in its inflorescence; a character which excludes it from the generic limits of *Tetraplasandra* as hitherto known. It does not appear to be very closely related to the other species, certainly not to the.... known Kauai species, and bears only a superficial resemblance to *T. hawaiiensis* Gray in the pubescence."

The complete absence of umbellets, the presence of an elongate, simple raceme, the abundant, sunken, diamond-shaped pedicel-scars on the flowering rhachis, the strong tendency of the subtending floral bracts or bractlets to persist (at least into the early fruiting state seen by me), and the strictly uniseriate arrangement of the stamens even when they are numerous,—these five characters stamp this species as well deserving a separate generic status apart from *Tetraplasandra*. Apparently the first collector to see trees of this species was Mr. George C. Munro, to whom students of Hawaiian plants have been most deeply indebted for his pioneer labors in the collection and preservation of Hawaiian plants, especially those native to the Island of Lanai. It is with great pleasure that the genus is here named in his honor.

Mr. Munro reported (according to Forbes, *loc. cit.*) having seen this tree on ridges somewhere between Makaweli and Hanapepe, in far-southern Kauai. It is likely, however, that the tree or trees seen by Mr. Munro would represent a variety different from *M. racemosum* proper (*i.e.*, var. *racemosum*). Meanwhile, we may note a second collection by Forbes, cited by Forbes for his *T. racemosa*, but which is varietally distinct and may be named:

Munroidendron racemosum Forbesii var. nov. — Petioluli mediani inferioresque tenues 7-11 mm. longi. Pedicelli circ. 7-8 mm. longi, non reflexi (unico racemo circ. 2.5 dm. longo viso); bracteis setiformibus, acrioribus, atris, plus minusve glabrescentibus.—Specimens examined: *Charles Noyes Forbes* 709-*K*, Haupu Range near Nawiliwili Bay, southeasternmost Kauai, Oct. 31, 1916 (type, Bish., 2 sheets, my photographs no. 4,341 and no. 4,342).—According to Forbes *(loc. cit.)*, "only one tree was seen at the Haupu Station, although probably others occur."

Munroidendron racemosum Macdanielsii var. nov. — Foliola supra glabra coriaceaque, basi minus obliqua sed valdius cordata, circumambitu saepius cordata (etiam terminali), usque ad 9.5 cm. longa et 7 cm. lata, petiolulis robustis 1-3 mm. longis. Inflorescentia non visa.—Specimens examined: *Laurence Howland MacDaniels* 849, tree 6 m. tall, rather dry slope, alt. 400 m., Nonou, eastern (slightly northeastern) Kauai, Feb. 23, 1927 (type, Bish., my photograph no. 4,343).

In vars. *racemosum* and *Forbesii*, the leaflets are mostly 1-2 cm. apart from each other on each side of the rhachis, whereas in var. *Macdanielsii* they *overlap* each other by a like amount. Moreover, in var. *Macdanielsii* the broader, more deeply cordate, and shorter-petiolulate leaflet-bases of any one pair tend to overlap each other conspicuously.

Chicago Natural History Museum, Chicago, Illinois.

VI. A pink-flowered form of Vicia villosa Roth.

By Earl Edward Sherff

In recent years, the so-called Hairy Vetch or Winter-Vetch, *Vicia villosa* Roth, has escaped from cultivation and become widely established in the United States. I have seen vast areas covered with it in southern Michigan and northern Indiana, but always until recently the flowers had only the essentially violet-colored corollas typical of the species. A forma *albiflora* (Schur) Gams is known, having the corollas entirely white, but I have never found it growing in either of the two states. However, in August of 1952 a forma with bright rosy-pink corollas was discovered in southwestern Michigan. The plants were growing in the midst of many others having the typically violet-colored corollas. From a distance, their numerous erect, pink-flowered racemes suggested orchids or hyacinths. A dozen or more specimens were obtained and will be distributed to herbaria. As the forma seems never to have been named, it is here named:

Vicia villosa rosea f. nov.—A specie ipsa corollis roseis non violaceis purpureisve differt.—Specimens examined: *E. E. Sherff* 5,064, in sterile, sandy soil, growing with f. *villosa*, nearly 2 km. west of Yankee Springs Store, Barry County, Michigan, Aug. 27, 1952 (type, Chi.).

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BOTANICAL LEAFLETS

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I. Further notes on the genus Tetraplasandra A. Gray (fam. Araliaceae) in the Hawaiian Islands.

By EARL EDWARD SHERFF

The abbreviations used for the depositories cited in the following texts are the same as previously listed (Bot. Leafl. no. 7: 2. 1952), with the addition of Amh., Herb. Massachusetts State University, Amherst.

Tetraplasandra oahuensis (A. Gray) Harms, var. **venulosior** var. nov.—Foliola 5-7, infima ovata vel ovali-oblonga, mediana ovato-oblonga vel oblonga, terminalia obovata vel late oblanceolata, omnia ad apicem rotundata usque obtusa vel raro abrupte subacuta, ad basim obliquam cuneata usque rotundata, coriacea, supra saepius subnitida et conspicue depresso-venulosa, petiolulis lateralibus 3-8 mm. longis; petiolo 6.5-8 cm. longo. Pedunculus (unicus visus) tenuis, circ. 9 cm. longus, superne sublaevis, apice umbellulate conferteque ±30-pedicellatus; pedicellis compressis, glabris, circ. 9-13 mm. longis sub anthesin. Flores immaturi, staminibus 10-16. Drupae urceolato-ovoideae, compressae, calice demum 1 cm. longo et circ. 8 mm. lato, stylopodio convexo usque hemisphaerico-conico, distigmatato et circ. 2 mm. alto; pedicellis demum reflexis usque erectis.—Specimens examined (all from Isl. Oahu): *E. H. Bryan, Jr.*, 778, small tree 6-7 m. tall, corolla deep purple-brown, alt. 1,800 ft., rain-forest, Kipapa Gulch, Sept. 18, 1934 (Bish.; N.Y.); *Otto Degener*, Pig-God Trail, rainy summit, Punaluu, May 31, 1931 (N.Y., my photograph no. 4,352); *Degener* 18,015 *pro parte*, windy, forested summit, Pig-God Trail, Punaluu, Jan. 17, 1932 (Mo.; N.Y.); *Degener* 18,242, same place and date (Mo.; N.Y., my photograph no. 4,292); *Charles N. Forbes* 2,210-*O*, Headgate Trail, Wahiawa, Aug. 17-20, 1915 (Bish.); *Forbes* 2,215-*O*, Wahiawa-Kahana Trail, Aug. 17-20, 1915 (Bish.); *Edward P. Hume* 165, alt.

450 m., steep hillside, north ridge, Kaaawa, Apr. 12, 1931 (type, Bish., my photograph no. 4,351).

Since mature drupes are lacking on the type, these are described from *Degener* 18,015 *pro parte* and *Degener* 18,242.

It is through var. *venulosior* that *T. oahuensis* appears to make its closest approach to *T. pupukeensis* (especially the var. *megalopoda*). Var. *venulosior*, moreover, resembles *T. meiandra* var. *longipedunculata* so closely in foliage and in habit of inflorescence that without a stamen count or an inspection of at least submature drupes they cannot be told apart.

Tetraplasandra oahuensis (A. Gray) Harms, var. **pseudorhachis** var. nov.—Foliola 5 vel 7, lateralia subsessilia petiolulis tantum 1-4 mm. longis, petiolo tenui usque ad 1 dm. longo. Pedunculus solitarius robustus ±4.5 cm. longus et ±5 mm. crassus, transverse plus minusve scrobiculatus, apice ±12-radiatus; nonnullis radiis conspicue elongatis (usque ad ±8 cm. longis), omnibus plus minusve scrobiculato-furfuraceis, ±15-floris; pedicellis tenuibus 8-11 mm. longis; staminibus 10-16; drupis ovoideo-prismaticis, plerumque 3- vel 4-gonis, calice circ. 11 mm. alto, stylopodio vix 1 mm. alto, stigmatibus 3 vel 4 rarius 5.—Specimens examined: *G. W. Russ*, Waimano Gulch, Isl. Oahu, August, 1929 (type, Bish., my photograph no. 4,350).

The specimen had been determined as *T. meiandra*, but the florets have 10-16 stamens as in *T. oahuensis* and the ripe drupes too are more typical for the latter species. The lone stout, short peduncle might be mistaken for the rhachis found in some *Tetraplasandra taxa*, whence the epithet *pseudorhachis*. However, it bears a multiplicity of secondary branches (a rhachis seldom bearing more than 5 or 6) and these tend to disjoint from the apex as rays often do, leaving conspicuous circular pocks ±5 mm. across.

Tetraplasandra oahuensis (A. Gray) Harms, var. **Fauriei** var. nov.—Foliola nunc hebetia nunc plus minusve coriacea nitidaque etiam superne depresso-venulosa, mediana anguste oblonga, lamina saepius 8-9.5 cm. longa et 2.5-3.3 cm. lata; infima elliptico-oblonga usque parce ovalia, lamina 5-8 cm. longa et sub 3.3 cm. lata; 3 terminalia anguste elliptico-oblonga usque oblanceolata apice interdum truncato-rotundata

etiam retusa. Pedunculus (unicus visus) ±12 cm. longus, basim versus furfuraceus alibi glaber, apice circ. 8-radiatus; radiis tenuibus, arcuatis, suberectis, 3.5-4.5 cm. longis, ad apicem umbellulate 5-8-pedicellatis; pedicellis tenuibus, glabris, 6-8 mm. longis. Drupae immaturae, calice cylindrico usque cylindrico-obconico, circ. 9 mm. alto; stylopodio sub 2 mm. alto (stigmatibus 2 vel 3 etiam 4 vel 5 sed hactenus non discretis inclusis).—Specimens examined: *Abbé Urbain Faurie* 270, Konahuanui, Isl. of Oahu, October, 1909 (type, Par., my photograph no. 4,346: isotype, Arn., my photograph no. 4,353).

Tetraplasandra oahuensis (A. Gray) Harms, var. **longipes** var. primum nominat.—Foliola terminalia infimaque rhomboideo-obovata, lamina ±5.5-6 cm. longa et ±4 cm. lata; petiolulis 7-20 mm. longis. Pedunculi umbellate 2-4-congregati, ±16-18 cm. longi, moderate furfuracei, ±22-flori (radiis absentibus); pedicellis tenerrimis, sparsim furfuraceis, 1.2-2 cm. longis; corollis nondum expansis sub 5 mm. altis; calice obconico, circ. 6 mm. alto, glabrato usque plus minusve tomentello-furfuraceo; staminibus saltem 10-15; stigmatibus juvenilibus 4 vel 5. Drupae maturae ignotae; submaturae cylindricae, atrae (saltem siccae), calice circ. 12 mm. alto et circ. 5 mm. crasso, limbo brunneo-marginato patenteque conspicuo, stylopodio parvo conicoque sub 1.5 mm. alto, stigmatibus plerumque 2 interdum 3.—Specimens examined: *Joseph F. Rock* 4,831, Niu Valley, Isl. Oahu, Aug. 22, 1909 (type, Bish., my photograph no. 4,273).

Hillebrand's *Triplasandra oahuensis* var. *β.* (Fl. Haw. Isls. 153. 1888) was collected by himself at Niu and was this variety.

Tetraplasandra oahuensis (A. Gray) Harms, var. **pseudolongipes** Degener & Sherff, var. nov.—Folia (saltem sicca) pallida, ±4.5 dm. longa (petiolo ±13 cm. longo incluso), ±11-foliolata; folioli lamina sub 1 dm. longa et sub 4.5 cm. lata, saepius ovali-oblonga usque oblonga vel subobovata, apice saepius aegre acuminata, basi cuneato-contracta; petiolulis tenuibus 7-10 mm. longis. Pedunculus (unicus visus) ±1.6 dm. longus, laevis (unica cicatrice instructus), ad apicem ±10-radiatus; radiis arcuatis, suberectis, laevibus, circ. 3-3.7 cm. longis, ad apicem umbellulate circ. 5-7-pedicellatis; pedi-

cellis acriter angulatis, glabris usque furfuraceis, 6-9 mm. longis. Flores non visi. Drupae submaturae circ. 11 mm. altae (stylopodio circ. 1.5 mm. alto incluso); stigmatibus nunc 2 nunc 3.—Specimens examined: *Otto Degener* 2,968, Konahuanui, Isl. Oahu, Dec. 28, 1924 (type, N.Y., my photograph no. 4,347).

In the absence of flowers, the fruits, which are essentially typical for *T. oahuensis* except with fewer stigmas, have been relied upon for placing this variety in that species.

Tetraplasandra oahuensis (A. Gray) Harms, var. **eradiata** var. nov.—Arbor parva, foliis circ. 3 dm. longis, foliolis 7-13, coriaceis, glabris, lamina ovata usque lato-oblonga 6-8.5 cm. longa et 4-6.5 cm. lata, apice obtusa usque subacuta rarius subacuminata, basi obliqua abrupte lato-cuneata usque subtruncata; petiolulis 3-10 mm. longis. Pedunculi 3-5, interdum e rhachi sub 1.3 cm. longa orti, 5-8.5 cm. longi, ad apicem umbellulate circ. 16-20-pedicellati, pedicellis demum 13-15 mm. longis. Calyx cylindrico-prismaticus, 4-6 mm. altus. Petala 5 vel 6, circ. 6 mm. longa. Stamina 10-15, quam petala dimidio breviora, antheris recurvatis.* Ovarium 5- vel 6-loculatum. Drupae prismatico-ovoideae usque breviter prismatico-cylindricae, penta- vel hexagonae, calice 7.5-8 mm. alto et circ. 5-5.5 mm. crasso; stylopodio 5- vel 6-radiato, depresso-conico, circ. 2 mm. alto (stigmatibus nunc 2 vel 3 nunc 5 vel 6 pro unica umbellula inclusis).—Specimens examined (Isl. Oahu): *William Hillebrand,* Konahuanui (Bish., a liberal fruiting fragment *ex herb. Hillebrandii olim in Herbario Berolinensi*); *Hillebrand,* Nuuanu, 1867 (type, Gray, my photograph no. 4,223*b*: isotype, Kew, my photograph no. 4,274*b*).

The two Hillebrand sheets each bear two specimens and the label in each case gives the name *Triplasandra oahuensis* Seem. also both Nuuanu and Mt. Kaala for the habitat. One specimen on each sheet is in the flowering state and is seen to belong to the type collection of Hillebrand's *T. kaalae,* an inhabitant of Mt. Kaala. The other specimen has mature fruit and is seen to match very closely Hillebrand's description (Fl. Haw. Isls. 153. 1888) of *Triplasandra oahuensis* Seem., our

*In the absence of flowers on the type and isotype specimens examined, I have relied upon Hillebrand's text (see my discussion, above) for the petals and stamens.

*Tetraplasandra oahuensis.** It differs, however, from Gray's type material in such important respects that it may well be segregated varietally.

Tetraplasandra oahuensis var. **hailiensis** (Deg. & Sherff) Deg. & Sherff, comb. nov.; *Tetraplasandra meiandra* var. *hailiensis* Deg. & Sherff *ex Sherff*, Bot. Leafl. no. 7: 10. 1952. —Previously cited specimens of this variety lacked florets, hence information as to the number of their stamens was lacking. Recently, however, an additional specimen, *Degener* 18,247 (N.Y.), has come to hand. Its ample inflorescence bears numerous fruits and a lone, retarded floret. A careful dissection of the latter shows 7 petals *and 11 stamens,* compelling a transfer of the variety to *T. oahuensis* (A. Gray) Harms. In *T. meiandra* (Hillebr.) Harms, *the stamens are fewer and of the same number as the petals.*

Tetraplasandra kahanana Degener & Sherff, sp. nov. — Omnino glabra, sine dubio arbor; foliorum cicatricibus in ramulis demum magnis conspicuisque. Folia ±4 dm. longa petiolo tenui (3-4 mm. crasso) ±1 dm. longo incluso, 7- vel 9-foliolata; foliolis enitidis, aegre coriaceis et subobscure venosis, anguste usque moderate oblongis vel oblongo-ovatis vel (praecipue 3 terminalibus) obovatis; lamina 8-12.5 cm. longa et 3-6 cm. lata, apice subobtusa usque subacuta, basi vix obliqua late usque subanguste cuneata; petiolulis lateralibus tenuibus 10-15 mm. longis. Inflorescentiae (unicae visae) ±3 dm. longae 3 pedunculi umbellate congregati, arcuato-erecti, circ. 2-2.7 dm. longi, e basi usque ad apicem remote alterneque ramosi radiative; radiis tenuibus, arcuato-suberectis, paucis (±5) secundum pedunculos pluribus (±7) ad apices, 6-10 cm. longis, terminaliter umbellulateque circ. 7-10-pedicellatis; pedicellis tenuibus, ad anthesin subrectis usque arcuatis et erectis usque patentibus, plerumque 12-17 mm. longis (raro unico in subradium ±3 cm. longum transformato et terminaliter rursus paucipedicellato). Calyx ad anthesin

*Since Hillebrand knew his *T. kaalae* only from Mt. Kaala, it is of course obvious that the specimens in fruit were the ones that came from Nuuanu. In his text, Hillebrand cited the "slopes of Waiolani and Konahuanui." As Konahuanui slopes down on its northwest side into Nuuanu, we may well suppose that by naming Konahuanui specifically, Hillebrand was merely revealing more explicitly the exact habitat of the specimens previously attributed in a loose way to "Nuuanu" (in reality a long valley extending upwards of 8 km. to the southwest).

obconicus, 3.5-4 mm. altus et vix angustior. Corolla nondum expansa vix 4.5 mm. alta et 6 mm. lata, petalis 5 vel 6, unica matura visa lanceolata reflexa 6 mm. longa. Stamina 5, filamentis planis vix 2.5 mm. longis; antheris ovatis circ. 1.5 mm. longis sub medio affixis. Drupae maturae non visae, valde immaturae obovoideae; ovario dimidio inferiore, parte superiore depresso-hemisphaerica, stylopodio centrali vix conico sed pluriradiato, stigmatibus nondum discretis.—Specimens examined: *Otto Degener* 18,013, in forest, from Kahana church up ridge to summit of mountain southeast of Kahana Bay, Isl. Oahu, Jul. 3, 1932 (type, N.Y., my photograph no. 4,344: isotype, N.Y., leaves only, my photograph no. 4,345).

The five stamens place this species next to *T. meiandra*, but the racemosely (as well as at the apex umbellately) branched peduncles give an appearance to the inflorescence suggestive of *T. hawaiiensis*, *T. kauaiensis*, and *T. gymnocarpa*. (In *T. meiandra* var. *meiandra* a single lateral branch or ray is very rarely emitted from a peduncle, somewhere near the top.)—A plate was prepared some years ago by Kwan Kee Park from the type collection of *T. kahanana* but seems never to have been published.

Tetraplasandra kauaiensis occidua Degener & Sherff, var. nov.—Arbor ±8 m. alta, foliis 1.5-3 dm. longis; foliolis 9-15, imis lamina ovatis vel etiam ovali-subrotundis aliis oblongis vel terminali obovato, omnibus parvis 4-10 cm. longis et 2-5 cm. latis, apice obtusis usque parce acutis, basi obliqua truncatis usque aegre cordatis, coriaceis, supra glabris et saepe nitidis, infra plus minusve stellato-furfuraceis; petiolulis lateralibus tantum 1-2 (raro -5) mm. longis. Inflorescentiae minoris rhachis ±1-3 cm. longa, ramis primariis ±3, sub 1.5 dm. longis; radiis (ramis secundariis) tenuibus demum saepius 2.5-4 cm. longis racemose et (±5 ad ramorum apices) umbellate dispositis; floribus (paucis visis) raro infra plerumque ad radiorum apices umbellulate circ. 5- vel 6-congregatis; pedicellis primum brevissimis (sub 2 mm.) crassisque demum (cum fructibus) 2-4 mm. longis. Petala staminaque ±5. Drupae maturae ovoideae, calice circ. 6-7 mm. alto, apice tumido-conico circ. 4.5-5 mm. alto stigmatibus 3 vel saepius 4 subsessilibus inclusis.—Specimens examined: *Degener, Tam, Tousley, & Barber* 22,025, a 25 foot tree (its seed eaten by rats), topping lowly forested slope in rainy region, *mauka* of

[*i.e.*, inland from] McGregor, southeasternmost West Maui, Mar. 9, 1952 (type, Chi., my photograph no. 4,361: isotypes, Bish.; Brit.; Carn.; Chi., my photograph no. 4,362; Gray; N.Y.).

Tetraplasandra pupukeensis decipiens Degener & Sherff, var. nov.—Pedunculis floribus drupisque varietati *megalopodae* similis sed 5-9 foliolis differens, his minoribus, oblongo-lanceolatis vel oblongo-rhomboideis usque anguste ovatis vel (terminali) obovatis, apice acutis usque acuminatis, basi plus minusve attenuatis vel cuneatis et obliquis, lamina 4.5-10 cm. longa et 2-3.5 cm. lata, petiolulis lateralibus 3-11 mm. longis. Umbellulae circ. 18-22-florae, pedicellis 16-20 mm. longis. Stamina 10-12. Drupae 4-5-angulatae, prismaticae, calice circ. 1-1.1 cm. alto et 5-6 mm. crasso, stylopodio parvo conico 1.5-2 mm. alto 4-6 stigmatibus inclusis.—Specimens examined (Isl. Oahu) : *Otto Degener* 17,791, in shrubby rain-forest, growing with but rarer than no. 17,792 [under his no. 17,792 Degener collected two forms: *T. pupukeensis* var. *megalopoda* and its f. *trigona*], along summit-divide toward east of Pupukea-Kahuku Trail, Dec. 6, 1931 (N.Y.) ; *Degener* 17,974, windy rain-forest near top, west of Poamoho Trail, Laie[?], Aug. 25, 1935 (type, N.Y., my photograph no. 4,354) ; *Degener* 18,249, rain-forest at summit-divide toward east of trail, Pupukea-Kahuku, Dec. 6, 1931 (N.Y., my photograph no. 4,355).

The slender leaflets, with their more attenuate tips and bases and their veiny, coriaceous upper surfaces, offer a deceptive resemblance to those of *T. oahuensis* var. *venulosior* (whence the varietal name). The various characters of flowers and fruits, however, are more in agreement with those of *T. pupukeensis,* particularly the var. *megalopoda.*

Tetraplasandra lihuensis sp. nov.— Folia glabra ±5 dm. longa petiolo ±11 cm. longo et inferne ±1 cm. crasso incluso, ±13-foliolata; foliolis coriaceis, plus minusve oblongis (terminali minore ovato), supra medium subattenuatis, apice subacutis usque obtusis, basi interdum obliqua saepius truncatis vel parce subcordatis, lamina 10-19 cm. longis et circ. 6.5-9 cm. latis; petiolulis lateralibus subrobustis 5-15 mm. longis. Inflorescentia ter umbellata. Pedunculi ±3 umbellate congregati, ±1-1.5 dm. longi et ±5 mm. crassi, irregulariter furfuraceis, sine nodis, apice umbellate ±6-radiati; radiis valde

furfuraceis, acriter angulatis, sine nodis, 4-6.5 cm. longis, subpatentibus usque suberectis, apice umbellulate circ. 7-9-pedicellatis; pedicellis robustis, angulatis, ad anthesin circ. 8-13 mm. longis. Calyx prope anthesin cylindrico-obconicus, circ. 5 mm. altus et ad medium circ. 2-3 mm. crassus, limbo membranaceo late (circ. 2 mm.) extenso undulato. Corolla nondum expansa circ. 6-7 mm. alta et crassa, petalis 7 vel 8; staminibus numerosis, pluriseriatis; stigmatibus circ. 8. Drupae non visae.—Specimens examined: *Charles N. Forbes* 164-*K*, Power-Line Trail from Lihue, southeasternmost Kauai, Aug. 6-9, 1909 (type, Bish., my photograph no. 4,196); *Forbes* 286-*K*, tall tree, leaves glaucous, Wahiawa Mountains, southern Kauai, August, 1909 (Bish.).

Both specimens examined have their leaflets numerously but irregularly black-punctulate, but as this character seems attributable to some fungus growth (*e.g., Capnodium lanosum, cf.* Sherff, Bot. Ser. Field Mus. Nat. Hist. 22: 502. 1942), it has been omitted in the description.

Tetraplasandra lihuensis gracilipes var. nov. — Folia ±11-foliolata, foliolis submembranaceis basi contractis rotundatisve sed non vere truncatis, petiolulis lateralibus tenuibus 8-18 mm. longis. Pedunculi ±4, tenues, circ. 7-9 cm. longi et 2-3 mm. crassi, prope medium saepius unico nodo instructi, apice circ. 8-14-radiati; radiis gracilibus, sine nodis, 2-4 cm. longis, apice pauci- vel pluripedicellatis; pedicellis demum gracilibus ±8-13 mm. longis (tantum 4 visis). Flores non visi. Drupae maturae ovoideo-globosae, calice ±8 mm. alto, glabro, limbo obsoleto; stylopodio convexo-hemisphaerico vel mitriformi, 2-3 mm. alto, in typo dense minuteque erecto-hispidulo, abrupte in stylum circ. 1 mm. longum contracto; stigmatibus 4 vel imperfecte 5.—Specimens examined: *L. H. MacDaniels* 847, tree 10 m. tall, in rain-forest, alt. 850 m., upper Lihue ditch, southeasternmost Kauai, Feb. 21, 1927 (type, Bish., my photograph no. 4,356).

Unfortunately, *T. lihuensis* proper is unknown as yet in its fruiting state nor is var. *gracilipes* known as yet in its flowering state, hence association of the two as members of the same species is somewhat arbitrary. It seems doubtful, however, that var. *gracilipes* will be found more different from *T. lihuensis* proper than are the varieties of the larger-flowered *T. waialealae* from that species in its narrow sense.

The stylopodium is hispidulous in the type material. Small hairs can even be found at the limb of the fruiting calyx. Most of the hairs appear to belong there naturally (if so, affording a most anomalous character) rather than to have resulted from some fungus growth.

Tetraplasandra meiandra tenuistyloides Degener & Sherff, var. nov.—Arbor ±9.5 m. alta, pauciter ramosa. Folia usque ad ±4.5 dm. longa (petiolo ±13 cm. longo incluso), usque ad 9-foliolata; foliolis lamina oblongis vel subobovatis, apice obtusis usque rotundatis etiam emarginatis, basi obliquis et obtusis usque subtruncatis, usque ad 13 cm. longis et ad 7 cm. latis, coriaceis, supra plus minusve reticulato-venulosis; petiolulis lateralibus 5-20 mm. longis. Inflorescentia (unica visa) ter umbellata, sessilis, sublaevis; pedunculis ±4, circ. 6-7.5 cm. longis et 5 mm. crassis, vix nodulosis; radiis ±8-10, terminalibus, aegre arcuatis, fere omnino enodulatis, tenuibus, 2-4 cm. longis, terminaliter circ. 8-10-pedicellatis; pedicellis in umbellula, demum 6-8 mm. longis et 1-2 mm. crassis. Flores ignoti. Drupae (submaturae visae) ovoideae, compressae vel trigonae; calice circ. 1 cm. alto et 7-8 mm. crasso, apice constricto; stylopodio conico, circ. 3 mm. alto (2 vel 3 raro 4 stigmatibus his vix discretis inclusis), stylo vero deficiente. —Specimens examined: *Otto Degener* 21,790, tree 30 ft. tall, sparingly branched and spindly, Kulani Forest, Isl. Hawaii, Feb. 3, 1952 (type, Chi., my photograph no. 4,362: isotypes, Berl.; Bish.; Calif. Acad.; Gray; Kew; N.Y.; Par.; Phila.; Univ. Calif.).

Close to var. *tenuistylis* but differing distinctly above the calyx-limb in the drupes. From var. *rhynchocarpa* of the same region, its thicker and shorter drupes easily separate it.

Tetraplasandra meiandra Bryanii var. nov.—Folia 7- vel 9-foliolata, petiolo tenui circ. 8-9 cm. longo; foliolis supra coriaceis subnitidis conspicue venulosis, ovatis vel oblongis (terminali subrhomboideo usque obovato), apice plus minusve acuminatis, basi parce nonve obliquis sed late vel moderate cuneatis, lamina 8.5-11 cm. longis et 4-6.5 cm. latis; petiolulis lateralibus 11-27 mm. longis. Pedunculi (solum unici soluti visi) forsitan solitarii, sublaeves, paucinodosi, 11-23 cm. longi, apice umbellulate circ. 10-15-pedicellati; pedicellis demum 2.2-3.2 cm. longis, subrectis arcuatisve, erectis vel patenti-adscendentibus, moderate tenuibus (1-1.5 mm. crassis). Flores

non visi. Drupae ovoideo-cylindricae, compressae vel trigonae, calice tenuiter urceolato 11-14 mm. alto et 6-8 mm. crasso, limbo extenso conspicuo; stylopodio conico 4-5 mm. alto 2 vel saepius 3 stigmatibus inclusis.—Specimens examined: *Edwin H. Bryan, Jr.*, 878, small tree 5-6 m. tall, in very wet rainforest near the summit ridge, alt. 2,150 ft., Kawailoa, Isl. Oahu, Nov. 20, 1934 (type, Bish., my photograph no. 4,357: isotype, U.S., my photograph no. 4,358).

Mr. Bryan had referred his collection to *T. meiandra*. The elongate peduncles and pedicels might suggest also *T. pupukeensis* var. *megalopoda*, but the conspicuous, elongate, conical stylopodium indicates closer affinity with *T. meiandra*. From *T. meiandra* var. *longipedunculata* Skottsb., a variety comparable as to inflorescence, var. *Bryanii* differs in having lateral petiolules 11-27 not 5-15 mm. long, 10-15 not 15-30 pedicels, the pedicels finally 2.2-3.2 not 11-20 mm. long, drupes thicker (6-8 not about 5-6 mm.), stylopodium finally 4-5 not 2-3 mm. tall, etc.

Tetraplasandra waianensis Deg. **palehuana** var. nov. — Foliorum petioli ±1 dm. longi; foliolis 5-11, lamina late ovali-oblongis vel interdum subcordato-subrotundis, apice obtusis vel rotundatis vel raro subacuminatis, plerumque 7-12.5 cm. longis et 5-8.5 cm. latis. Flores ignoti. Drupae maturae ovoideo-prismaticae, grosse 4- vel interdum 5-gonae, inter angulos profunde lateque sulcatae, apice truncatae, calice 10-11 mm. alto et limbo angusto undulatoque coronato; stylopodio tenuiter conico, ±2.5 mm. alto (stylo indiscreto et 4 interdum 5 stigmatibus inclusis).—Specimens examined: *Otto Degener* 17,971, Middle Palawai Ridge, Waianae Mountains, Isl. Oahu, May 12, 1936 (topotype, N.Y., my photograph no. 4,297); *Charles N. Forbes* 1,674-*O*, Palehua, Waianae Mts., Isl. Oahu, Apr. 1-4, 1911 (type, Bish., my photograph no. 4,296).

Tetraplasandra kaalae (Hillebr.) Harms, var. **multiplex** nov. —Folia ±2 dm. longa, 5-foliolata, foliolis moderate minoribus, petiolulis lateralibus tantum 2-7 mm. longis; inflorescentia nunc ter nunc quater umbellata, pedunculis 3-7 cm. longis; radiis nunc paucis (±8) nunc numerosioribus (±17), tantum 2-4.5 cm. longis, apice interdum umbellate in 5-7 subradios acriter angulatos plus minusve arcuatos ±1.5 cm. longos ramosis; pedicellis 3-5 in umbellula terminali, tenuibus,

circ. 3-4 mm. longis. Drupae ovoideae, calice circ. 8 mm. alto et 6 mm. crasso, apice magis pyramidato.—Specimens examined: *G. W. Russ*, Makua, northwestern Oahu, January, 1930 (type, Bish., my photograph no. 4,193).

The type had been determined at the Bishop Museum as *T. kaalae*, but the differences from *T. kaalae* proper are so numerous as to justify at least a distinct varietal rank. The type sheet bears a flowering spray having two 5-foliolate leaves and a sessile, thrice compound umbel with but two peduncles. Separately mounted are two more inflorescences. These have a long stalk, one 4.5 cm. and one 7 cm. long. By comparison within the genus, these stalks appear better designated as peduncles than rhachises. It is assumed that two or more are umbellately clustered; this being the case, the whole inflorescences are 4 times umbellate, with a set of subrays between the rays proper and the pedicels.

Tetraplasandra A. Gray sect. **Neotetraplasandra** sect. nov.; *syn.* sect. Eutetraplasandra Harms *in* Engler & Prantl, Nat. Pflanzenfam. 3: 8: 29. 1898 (*exclud. T. hawaiiensem*). — Stamina petala bis-octies, inflorescentia simpliciter vel bis-quater umbellata vel interdum pro minima parte usque racemoso-paniculata; foliis facie inferiore plerumque glabris.—Type, *Tetraplasandra waimeae* Wawra, Flora 56: 158. 1873.

Harms (*loc. cit.*) divided *Tetraplasandra* as known to him into two sections: Eutetraplasandra and Nothotetraplasandra. The latter section, containing the great *T. meiandra* complex, is worthy of retention without modification. The former section, however, seems best restricted to the single species *T. hawaiiensis* A. Gray, the type species of the genus, a species with tomentose lower leaf-surfaces, paniculate inflorescence, and stamens four times as many as petals or fewer and in a single circle. We then have twelve species, most of them with several varieties, which may be grouped under the new section Neotetraplasandra, characterized as noted above. They are: *T. waimeae* Wawra, *T. waialealae* Rock, *T. pupukeensis* Skottsb., *T. lihuensis* Sherff, *T. kohalae* Skottsb., *T. lanaiensis* Rock, *T. Munroi* Sherff, *T. Lydgatei* (Hillebr.) Harms, *T. oahuensis* (A. Gray) Harms, *T. waianensis* Deg., *T. kaalae* (Hillebr.) Harms, and *T. bisattenuata* Sherff.

Tetraplasandra gymnocarpa var. *β.* pupukeensis (Deg.)

comb. nov.; *Pterotropia gymnocarpa* var. *pupukeensis* Deg. Fl. Haw. fam. 281. Aug. 24, 1938.

Seemingly this is a good variety, but its recognition is at times more difficult than that of most varieties, certainly of the other varieties of *T. gymnocarpa.*

Chicago Natural History Museum, Chicago, Illinois.

II. Notes on miscellaneous dicotyledonous plants.

By Earl Edward Sherff

Pittosporum dolosum var. **aquilonium Sherff**, Bot. Ser. Field Mus. 22: 422. 1941; *ibid.* 22: 512. 1942.—This variety was known earlier only from "the Land-Section of Paalaa, northern Oahu, and rare southward in Kipapa Gulch, Oahu." A collection by Degener extended this range northward on Oahu and one more recently by Hatheway extends it considerably westward: *Otto Degener*, Anahulu Trail, Mar. 23, 1939 (Berl.; Chi.); *William H. Hatheway* 517, spindly tree 20 ft. tall, trunk 2 inches diam. at breast-height, occurring in small cluster in very rich mixed dry forest, alt. 1,200 ft., West Branch of East Makaleha Valley, Mokuleia, *anno* 1950 (Chi.).—Hatheway's label is important as showing the variety to be a "tree 20 ft. tall." It has been known heretofore as a "shrub ±2 meters tall or perhaps becoming a small tree."

Pittosporum confertiflorum A. Gray, Bot. U.S. Explor. Exped. 232, pl. 19. 1854.—In my revision of *Pittosporum* Banks for the Hawaiian Islands (*vide* Bot. Ser. Field Mus. Nat. Hist. 22: 467-580. 1942), the islands of Maui and Hawaii were cited (p. 554) for this species in its narrower sense, but for the latter island the only locality given was Kahuku, doubtless the Kahuku near the south end. Some time subsequent to the revision, material came in from Kapapala Ranch of far-southern Hawaii. Two specimens before me extend still further the range on Hawaii: *Miss Amy Greenwell* (*Degener's distrib. no.* 19,558), along roadside, South Kona-Kau boundary, Mar. 14, 1949 (Chi.); *Greenwell* (*Degener's distrib. no.* 21,388), flowers creamy, fragrant, near Ahuaumi, Central Plateau, June 24, 1951 (Chi.).

Nototrichium sandwicense var. **Syringifolium** Sherff, Bot. Leafl. no. 1: 2. 1950; *ibid.* no. 4: 10. 1951.—This rare variety was founded upon a single branchlet collected by Hillebrand, somewhere in the Hawaiian Islands. Its leaves had blades very thin, broadly ovate, to naked eye *seemingly* glabrate (in reality appressed-hispidulous) above, grayish-silky or -tomentulose beneath, at base widely truncate or subcordate, at apex sharply acuminate, ±7.5 cm. long and ±4.8 cm. wide; petioles slender and scarcely margined, ±1.5 cm. long. Recently Dr. Otto Degener sent me a suite of branchlets *with leaves only*, but which seem to be this variety. The leaves are not "dark" at all as on the very old specimen used for the type, but are, as might be expected of freshly preserved material, a fairly light-brownish-green above and silvery-silky beneath. The larger leaves (*i.e.*, with blades 8-9.5 cm. long and 5.5-7 cm. wide) tend to be subtruncate to subcordate at base of blade, but nearly all smaller leaves (*i. e.*, with blades 3-6 cm. long and 2-4.5 cm. wide) are merely broad-cuneate to rounded at base. With the hope that specimens in flower and fruit may be collected by others and further studies made of this very unique variety, Dr. Degener's collection is here cited formally: *Degener* 20,704, very rare, ledges and cliffs of Manini Gulch, Kaena, northwesternmost Oahu, Jul. 26, 1950 (Berl.; Bish.; Chi., my photograph no. 4,363; Gray; Kew; N.Y.; U.S.).

Schiedea Remyi Mann, Proc. Bost. Soc. Nat. Hist. 10: 310. 1866; Sherff, Brittonia 5: 328. 1945.—The leaves remaining on fruiting or flowering branchlets are usually 1- or less often sub-3-nerved and 3 to 6 or even to 11 cm. long by 3 to 8 mm. wide. Recently a large suite of very immature, mostly mere vegetative material has come to hand, with numerous lower leaves 3- or even sub-5-nerved and 12 to 17 cm. long by 14 to 16 or even to 30 mm. wide. The species has a restricted distribution on Molokai, Oahu and Maui. For the last-named island, it has been known till now only from "at or near to east and west ends." The present suite comes from a locality almost midway between the two ends: *Otto Degener* 21,952, on ledges facing ocean, Mahiku, near Paia, East Maui, Feb. 26, 1952 (Amh.; Bish.; Calif. Acad.; Chi., my photograph no. 4,371; Del.; Gray; Kew; Mo.; N.Y.; Par.; Phila.; Univ. Calif.; U.S.).

Dodonaea eriocarpa Smith var. **eriocarpa**; *D. eriocarpa* var. *typica* Sherff, Amer. Journ. Bot. 32: 204. 1945.—For this variety I have given previously (*loc. cit.*) a description and discussion, also a list of specimens from the Islands of Molokai and Hawaii. Two specimens are now at hand from West Maui: *Otto Degener & Harvey Alfred Miller* 21,129, shrubs 4-7 ft. tall, shrubby slope at 2,000 ft., Hanakaoo Gulch, near Lahaina, Nov. 27, 1950 (Bish.; Chi.).

Dodonaea viscosa var. **arborescens** f. **spatulata** (Smith) Sherff, *op. cit.* 214.—Collected at the same time and place with the last preceding specimens and confused with them in the field by the collectors, was a considerable suite of this f. *spatulata*. In a previous paper (Bot. Ser. Field Mus. Nat. Hist. 23: 301. 1947) I cited, for Maui, only East Maui material. The present material extends the known range for Maui into West Maui: *Degener & Miller* 21,129 *pro parte* (renumbered by me, 21,129*a*; Berl.; Bish.; Chi.; Goth.; Gray; Kew; N.Y.).

Antidesma pulvinatum contractum Degener & Sherff, var. nov.—Foliorum laminae apice acriter saepe elongate acuminatae, basi contractae et plus minusve lato-cuneatae, 11-16 cm. longae et 5-7 cm. latae, oblongae vel oblongo-obovatae, supra glabrae infra puberulae (sed in angulis venae medianae cum venis lateralibus non valde conspicueque hirtae); petiolis subrobustis, 5-15 mm. longis et 1-2.2 mm. crassis, rectis vel subrectis. Inflorescentia feminea non visa, masculina circ. 5 cm. longa, delicata, conspicue albo-hispida, ramis pallide purpureo-rubris, pedicellis sub 0.3 mm. longis, calicibus circ. 1-1.3 mm. altis, staminibus valde exsertis.—Specimens examined: *Otto Degener, Toshio Murashige, & Mark Kerr* 20,152, in forest at 2,000 feet, along Saddle Road 7 miles from Hilo, Isl. Hawaii, Sept. 5, 1949 (type, Chi., my photograph no. 4,364: isotypes, Bish.; N. Y.).

In 1936, Fosberg (Occas. Paps. Bishop Mus. 12: 15. 7) presented a short key to the members of the genus *Antidesma* L. (fam. Euphorbiaceae) for the Hawaiian Islands. Shortly afterwards appeared my own paper giving notes on *Antidesma* for the same islands (Bot. Ser. Field Mus. Nat. Hist. 17: 568-576. 1939). In that paper three new *taxa* were described,

to accommodate which, along with the above new var. *contractum*, Fosberg's key may now be expanded as follows:*

a. Petiole straight or straightish, slender.

b. Leaf-blades apically short-acuminate or to obtuse or even rounded, basally cordate to subtruncate.

c. Leaf-blades commonly short-acuminate, with a villous patch in the angles of the median and lateral veins on the more or less pilosulous lower surface; drupe 4-6 mm. in diameter.....*A. pulvinatum* Hillebr. Fl. Haw. Isls. 403. 1888.

c. Leaf-blades apparently more obtuse at apex, merely few-setulose or commonly even glabrous in the vein-angles of the lower surface; native of northwestern Oahu.....*A. pulvinatum* var. *leiogonum* Sherff, Bot. Ser. Field Mus. Nat. Hist. 17: 576. 1939.

b. Leaf-blades apically sharp- and often elongate-acuminate, basally contracted and more or less wide-cuneate; villous patches mostly obsolete in vein-angles beneath.....*A. pulvinatum* var. *contractum* (*vide supra*).

a. Petiole curved, stout, 2 mm. or more thick near base, fruit 7-12 mm. in diameter.

b. Leaves shortly and sparsely pubescent beneath; native of northeast Hawaii.....*A. platyphyllum* var. *hamakuaense* Fosb. *op. cit.* 8.

b. Leaves glabrous on both surfaces.

c. Leaves shiny on both faces even when dry, blades obtuse at apex and broadest at or near the subcordate base; disk of pistillate flowers ciliate; stone of fruit semiterete; native of Isl. Kauai.....*A. platyphyllum* var. *Hillebrandii* Pax & Hoffm. *in* Engler & Prantl, Pflanzenreich IV. 147. xv. 162. 1922.

c. Leaves rather dull when dry; stone of mature drupe strongly flattened.

d. Leaf-blades finally more or less conduplicate on

*Omitted from the key is the putative hybrid, × *A. kapuae* Rock (Indig. Trees Haw. Isls. 249. 1913), reported by Rock from "the lava fields of South Kona, Hawaii, at an elevation of 2000 feet," where both *A. platyphyllum* and *A. pulvinatum* "are extremely common." Quoting Rock, the leaves are "as in *A. platyphyllum*, but quite acuminate, while the fruits are almost exactly" as in *A. pulvinatum*.

drying, often 1-1.5 or even -2 dm. long and 5.5-7.3 cm. wide, more or less subamplexicaulous at their rotundate or cordate base; widely distributed on Kauai.....*A. platyphyllum* var. *subamplexicaule* Sherff, *op. cit.* 573.

d. Leaf-blades usually drying flat, smaller and proportionately broader, not at all amplexicaulous; widely distributed on Oahu, Molokai, Lanai, East and West Maui, and Hawaii, but known on Kauai only from Wainiha Valley in northern part..... *A. platyphyllum* H. Mann, Enum. Haw. Pl. no. 444 (Proc. Amer. Acad. 7: 202). 1867.*

Phyllostegia brevidens var. **heterodoxa** Sherff, Amer. Journ. Bot. 21: 700. 1934; Bish. Mus. Bull. no. 136: 23. 1935.—This variety was founded upon a single collection, *Rock* 10,014, Naalehu, toward the southern extremity of the southeast coast of Hawaii. The range is now seen to extend considerably to the northeast: *Degener & Greenwell* 21,849, scandent, flowers pure white, rare in rich forest clearing at 5,000 ft. alt., *mauka* of Kulani Prison, Isl. Hawaii, Feb. 15, 1952 (Amh.; Berl.; Bish.; Carn.; Chi., my photograph no. 4,368; Del.; Gray; Kew; N.Y.; U.S.).

Phyllostegia macrophylla var. **velutina** Sherff, Bot. Gaz. 96: 137. 1934; Bishop Mus. Bull. no. 136: 22. 1935.—This variety has been known so far only from Mauna Kea and the quadrangles Kailua and Honuapo, all on the island of Hawaii. Nothing apparently was known about the color of its corollas, although for the species proper the color had been described as pale lilac. An exceptionally fine suite of the variety is now at hand. The collectors noted the habit of the plants as scandent and the corolla-color as white. The range is seen to be extended into the Humuula Quadrangle of Hawaii: *Degener & Greenwell* 21,843, scandent, corolla white, in rich forest clearing, common, *mauka* of Kulani Prison, Isl. Hawaii, Feb. 15, 1952 (Amh.; Berl.; Bish.; Calif. Acad.; Carn.; Chi.; Del.; Goth.; Gray; Kew; Mo.; N.Y.; Par.; Phila.; Stockh.; Univ. Calif.; U.S.; etc.).

*Mature drupes *purplish-black*. A f. *rubrum* Deg. & Sherff *ex* Sherff, *op. cit.* 571 has mature drupes *red before drying*. It is known at present only from a single tree (*Degener* 8,131) in rain-forest, Pupukea-Kahuku Trail at the divide, Isl. Oahu, but should be looked for in other *A. platyphyllum* populations.

Phyllostegia brevidens var. **hirsutula** (Hillebr.) Sherff, Amer. Journ. Bot. 21: 699. 1934; Bishop Mus. Bull. no. 136: 25. 1935.—This rare variety was described originally by Hillebrand (Fl. Haw. Isls. 349. 1888) as a variety of *P. grandiflora* Benth. His type, which perished with the recent destruction by war of the great Berlin Herbarium, was *E. Bishop* 76 from the forests of West Maui. Fortunately, my photograph (no. 2,925) of the type is preserved and is now before me. With its aid, it is now possible to confirm for this variety a fine suite of specimens sent in last year by Dr. Otto Degener: *Degener, Tam, Tousley, & Barber* 22,024 (erect, roundish, leafy, 3 ft. bush; flowers white, fragrant), rain-forest *mauka* of McGregor, West Maui, Mar. 9, 1952 (Berl.; Bish.; Chi., my photograph no. 4,365; Del.; Kew; N.Y.; U.S.). These are of special importance for the precise data accompanying them as to habitat and flowers. I am designating one specimen (Chi.) as *lectotype*.

Hillebrand (*loc. cit.*) described his variety *hirsutula* as "hirsute in all parts with soft scarcely spreading hair, but rather glabrate with age." His type was still hirsute. In the present suite, the oldest leaves are less densely hirsute than the somewhat younger ones, but still far from "glabrate." The axis of the inflorescence is densely hispid, with practically all of the hairs spreading. To allow properly for this variety, the key in my revision of the genus *Phyllostegia* (Bish. Mus. Bull. no. 136. 13) should have the third line for the second letter *i* recast to read: "Subappressed-hispid or spreading-hispid..... **6. P. brevidens and varieties.**"

Phyllostegia mollis Hochreutineri var nov. — Varietati *Skottsbergii* circumambitu foliorum similis, sed differt: pedicellis (setis terminaliter glandulosis vestitis) brevioribus (sub 4.5 non 4-10 mm. longis), calicibus minoribus tubo sub 3 non 4-5 mm. longo, corollae labio inferiore breviore circ. 5 non circ. 9 mm. longo, superiore 2-3 non circ. 4 mm. longo.—Specimens examined: *B. P. G. Hochreutiner* 3,579, near the Gay cottage [at Kaholuamanu], Waimea, Isl. Hawaii, Apr. 20, 1905 (type, Del., my photograph no. 2,995).

The type label gives the flowers as "blanches" but whether this means a *pure-white* corolla, instead of *pinkish-white* as in the species proper, or merely *hoary-white* because of a

whitish-pubescence, I do not know. The specimen was said to have been a solitary one growing among ferns in a "forêt de *Metroxylon.*" The vernacular name "Néhé Kuhevi" accompanies the data.

The type was studied some twenty years ago by me but laid aside until more material might be obtained. Recently, on the occasion of the eightieth anniversary (March 3rd, 1953) of Dr. Hochreutiner's birth, I recurred to its consideration. Fortunately, the var. *Skottsbergii* Sherff (of northwestern Kauai) and its synonym, var. *resinosa* Fosberg, had been described meanwhile (*cf.* Sherff, Bish. Mus. Occas. Paps. 20: 1: 12. 1949), and with the aid of their specimens it was found possible to orient the Hochreutiner plant satisfactorily as a variety of *P. mollis* Benth. Since only the type photograph and my scanty notes are at hand for a description, the type should be re-examined for further distinctions.

Stenogyne Calaminthoides var. **oxyodonta** Sherff, Amer. Journ. Bot. 21: 701. 1934; Bishop Mus. Bull. no. 136: 63, fig. 20. 1935.—The only specimens hitherto known for this variety were *Rock* 8,379 (2 type sheets, Bish.) and *Rock* 8,381 (Bish.). For both, the locality was given merely as the Hawaiian Islands. The variety has recently been collected in eastern Hawaii. The leaves are more conspicuously depressed-veiny above and salient-veiny beneath, and the calyx-lobes are proportionately a mere trifle shorter than in the type, but otherwise there seems no difference. The collectors noted slight differences in color of corolla and, as will be seen below, suspected hybridization in one case.*—Specimens examined: *Degener & Greenwell* 21,844, flowers claret, *mauka* of Kulani Prison, Isl. Hawaii, Feb. 15, 1952 (Bish.; Chi.; N.Y.); *Degener & Greenwell* 21,846, same place and date, "flowers pale-claret, perhaps more or less hybridized" (Amh.; Bish.; Chi.; etc.).

Whether the var. *oxyodonta* may prove to be of hybrid nature (perhaps between *S. Calaminthoides* and *S. sessilis*) I cannot say. Two characters, however, may be mentioned for the variety, as represented by the above-cited specimens, *versus* its supravening species, characters that perhaps were

*Their no. 21,845, growing at the same spot, was *S. sessilis* Benth. Its flowers were noted in the field as dark claret. Their no. 21,848, likewise growing at the same spot, was *S. Calaminthoides sensu stricto.* Its corollas were noted as pale-yellow with the upper curve pink-tinged.

overlooked originally. These are the more acute leaf-blades and the denser, more nearly uniform pubescence covering the corollas.

Stenogyne oxygona Degener & Sherff, sp. nov.—Suffruticosa, ut videtur scandens; caule acerrime quadrangulato (angulis vix subalatis interdum plus minusve armatis spinulis minimis retrorsis e tuberculo nitido ortis), circ. 2-2.5 mm. crasso, faciebus plerumque subpurpureo-tristriatis et marginaliter atropurpureis, glaberrimis, internodiis 5-9.5 cm. longis. Folia petiolata petiolis 7-12 mm. longis, nunc angustis nunc latioribus (usque ad 1.2 mm.), purpureis, faciebus glabris marginibus acriter albo-setosis (basim versus retrorsum apicem versus plerumque antrorsum), laminis membranaceis ovatis vel rarius lanceolato-ovatis, vivis dictis superne nitidis, apice acuminatis basi rotundis usque truncatis, omnino glaberrimis, marginibus acriter dentulatis (circ. 17-21 dentulis pro unico latere, his abrupte patenteque submucronulatis), principalibus 5-7.5 cm. longis et 3-4.5 cm. latis. Verticillastra plerumque 6- rarius 4-flora; pedicellis gracilibus, 2-9 mm. longis subsparsim et plerumque subretrorsum hispidis, interdum in pedunculo obsoletissimo parce 1 mm. alto congregatis; bracteis angustissime linearibus, ciliatis, sub 3 mm. longis. Calyx obconicus, viridis (basi forsitan excepta), 11-15 mm. altus, extus sparsim antrorso-hispidus et manifeste nervatus, ±dimidio in lobos acutos lineares vel lanceolatos dense antrorsumque ciliatos incisus. Corolla pallido-rubida, circ. 2.2 cm. longa, extus densissime adpresso-hispida setis tenuibus acribus albidis, labiis subaequalibus circ. 5-6 mm. longis; labii inferioris lobis deltoideo-ovatis, mediano proxime abrupte contracto. Filamenta elongate patenteque hispida (saltem supra). Nuculae maturae non visae. — Specimens examined: *Otto Degener & Miss Amy Greenwell* 21,873, leaves shiny above, corolla pale-pink, on partly shaded side of trail, small deep gorge east of Honokanenui Valley, North Kohala, Isl. Hawaii, Feb. 18, 1952 (type, Chi., my photograph no. 4,369: isotypes, Bish.; Gray, my photograph no. 4,370; N.Y.).

In the key presented in my former treatment of *Stenogyne* (Bish. Mus. Bull. no. 136: 59. 1935), this species would go to the first *a*, the second *b*, the second *c* thereunder, and the second *d* thereunder. Thereafter it would go better to the first *e* (although its calyx-lobes average broader). It might fit the

first *f* thereunder except that its leaf-blades are *commonly* ovate. Nor could it fit the second *f*, because they are not *cinereo-pubescent* or ever *basally cordate*, and the plant is not a native of *East Maui*. A third *f* might well be inserted, to read: Leaf-blades commonly ovate, basally rounded to truncate, glabrous; native of northernmost Hawaii.... **S. oxygona.**

Apparently *S. kaalae* Wawra and *S. Sherffii* Deg. are the nearest allies, but, along with other differences, they both have, in their 4-6-flowered verticillasters, a definite, slender peduncle subtending each two or three pedicels.

Stenogyne diffusa var. **glabra** Wawra, Flora 55: 532. 1872.—The corollas of *S. diffusa* A. Gray are greenish-yellow, but until now those of the more abundant var. *glabra* seem not to have been noted as to color. In recently collected material of var. *glabra*, the corollas were in effect described as to color: *Miss Amy Greenwell* (*Degener's distrib. no.* 21,387), "flowers light green tinged pink," Puu Keanui, Central Plateau, Isl. Hawaii, Jul. 1, 1951 (Chi.; N.Y.).

Gnaphalium sandwicensium var. **kilaueanum** Deg. & Sherff *ex* Sherff, Amer. Journ. Bot. 36: 505. 1949.—This variety has been known previously only from the Kilauea region of southern Hawaii. It has recently been found to the northwest on the same island: *Amy Greenwell* (*Degener's distrib no.* 21,391), very common, with strong, unpleasant odor, Halelaau, Central Plateau, June 24, 1951 (Chi.).

At the time of its original description, this variety was placed in that portion of the key where the pappus-bristles were separate or free. This seems to have been an error, for in the *Greenwell* plant the bristles are coherent at the very base (the original specimens should be restudied as to this character).

Bidens subalternans DC Prodr. 5: 600. 1836; *cf.* Sherff, Bot. Ser. Field Mus. Nat. Hist. 461, pl. 110. 1937.—This species has been known in days past from "Uruguay and central Argentina to northern and western Brazil; found long ago (*Mac Gillivray*) on the Isle of Pines in the West Indies" (Sherff, *op. cit.* 462). It has been found recently in Colombia and New South Wales: *Joseph A. Ewan* 15,859, rayless annual, occasional in weedy waste places, about 1,000 m. alt., Rio Cali in

vicin. of Cali, Dept. Valle del Cauca, Colombia, Jul. 2, 1944 (Chi.; leaves less bipinnate, approaching those of var. *unipinnata* Sherff); *W. Waterhouse*, single plant in railroad enclosure with *B. bipinnata* L., adventive at Lindfield, N. S. Wales, April, 1951 (Nat. Herb. N. S. Wales Bot. Gardens).

Bidens pilosa var. **calcicola** (Greenm.) Sherff.*—In my revision of the genus *Bidens* cited below,* the geographic distribution of this variety was given as "in Mexico from the states of Tamaulipas, San Luis Potosí, and Nayarit southward to the states of Vera Cruz, Oaxaca, and Guerrero; also in Guatemala, Costa Rica, and Colombia; in the states of Rio Grande do Sul and São Paulo, Brazil, where apparently adventive." Later (Amer. Journ. Bot. 31: 278. 1944) the range as to South America was extended to include western Venezuela. A specimen before me extends the range still further to include (though perhaps as an adventive) west-central Florida: *Dana S. Carpenter*, New Port Richey, Oct. 19, 1936 (Calif. Acad.).

Bidens pilosa var. **calcicola** (Greenm.) Sherff* **triaristata** f. nov.—E varietate ipsa achaeniis plerumque tri- raro quadrirarius biaristatis differt.—Specimens examined: *Norman Carter Fassett* 25,037, weed in sugar-cane, headwaters of Quebrada Bagueche, above Arboledas, alt. 5,700 ft., Dept. Norte de Santander, Colombia, Apr. 10, 1944 (type, Chi., my photograph no. 4,366); *Percy Gentle* (*C. F. Lundell distrib no.* 5,001), Calcutta, Corozal District, British Honduras, September, 1933 (Calif. Acad., 2 sheets).

Typical *B. pilosa* var. *calcicola* has biaristate achenes. The present forma seems to differ little except in its triaristate achenes. Previous determinations of the var. *calcicola* should be checked to see if perchance some of them can be carried further to f. *triaristata*.

Bidens pilosa var. **calcicola simplex** f. nov.—Herba tenuis ±4 dm. alta, erecta e caule horizontali acriter tetragono nodis radicante, foliis simplicibus lamina ovata vel oblonge ovato-lanceolata 3-4.5 cm. longa dense ciliatis et utrinque sparsim adpresso-setulosis setis pluriloculatis.—Specimens examined:

*Bot. Gaz. 80: 377, pl. 20. 1925; Bot. Ser. Field Mus. 16: 455, pl. 108 and pl. 109, figs. *a* and *c-j*. 1937.

F. R. Fosberg 20,006, herb from running rhizomes, disk orange-yellow, rays white, abundant weed in and around coffee plantation, alt. 1,800 m., Palestina, along Quebradona, southwest of Pitalito, Dept. del Huila, Colombia, Feb. 7-8, 1943 (type, Chi., my photograph no. 4,367).

This interesting forma seems related to var. *calcicola* proper in somewhat the same way that the f. *indivisa* Sherff (Bot. Gaz. 88: 297. 1929) does to *B. pilosa* var. *radiata* Schz. Bip. The presence of a rhizome, with its connotation of a perennial habit, is interesting but apparently of little importance here (*cf. B. pilosa* var. *radiata* f. *Dondiaefolia* [Less.] Sherff, *op. cit.* 97: 607. 1936; Bot. Ser. Field Mus. Nat. Hist. 16: 440. 1937—a forma in which now the stem now the lower branches may root at the nodes and act as rhizomes).

Bidens pilosa var. **bimucronata** (Turcz.) O. E. Schulz *in* Urban, Symb. Antill. 7: 138. 1911.—This species has not been known to me heretofore from South America except for northern Venezuela. The following specimen extends the range in South America into Colombia: *Grant & Giovanni* 9,674, clearing in temperate forest, alt. 2,325 m., Las Musas, Canuelal Valley, 8 km. west of Gutiérrez, 45 km. south of Bogotá, Dept. Cundinamarca, Colombia, Jul. 25, 1944 (Chi.).

Bidens Rubifolia var.**Cuatrecasasii** Sherff, Bot. Leafl. no. 3: 8. 1951.—This remarkable variety has been known till now only from the type locality, alt. 3,080 meters, Quebrada de la Chorrera Barragán, valley of the Río Bugalagrande, western slope of the Cordillera Central, Dept. del Valle, Colombia. Its range is now seen to be extended somewhat to the south or southwest by the following specimen shown to me by Dr. Cuatrecasas: *José Cuatrecasas & E. Perez Arbelaez* 5,944, large suffruticose climbing herb, alt. 3,100-2,700 m., between Puracé and the Volcano (Puracé), *matorrales* in Chiquín, Cordillera Central, Dept. del Cauca, Colombia, Jul. 11, 1939 (Chi.).

Bidens tenera var. **paucidentata** (O. E. Schulz) Sherff, Bot. Gaz. 89: 362. 1930; Bot. Ser. Field Mus. Nat. Hist. 16: 408. 1937.—This variety has been known heretofore only from Cuba (the type locality), Venezuela (somehow omitted under "Distribution" *in loco secund. cit.*), and Bolivia. Its range is

now seen to be extended into Colombia: *W. R. Philipson, Jesús M. Idrobo, & A. Fernandez* 1,450, flowers yellow, in dense humid forest, near old camp, alt. 400 m., Plaza Bonita, Sierra de la Macarena, Nov. 16, 1949 (U.S.).

Bidens triplinervia boyacana var. nov. — Gracilis, ±5 dm. alta, plus minusve hispidula, foliis nunc simplicibus anguste linearibus 1.5-7.5 cm. longis et apicem versus usque ad 1 etiam 1.5 mm. latis deinde usque ad basim sensim angustatis; nunc prope medium pedatim 3-lobatis, lobis acribus lateralibus saepius 1-2 cm. longis et sub 1 mm. latis.—Specimens examined: *Harold St. John* 20,713, páramo, alt. 3,445 m., Lat. 5° 40′ N., Long. 73° 22′ W., 2 km. north of Cómbita, valley of Río Grande, Dept. Boyacá, Colombia, Sept. 1, 1944 (type, U.S., my photograph no. 4,373).—A variety somewhat suggestive of the peculiar type of *B. Crithmifolia* H.B.K. at Paris (my photograph no. 634), from Quito, Ecuador. In that plant, apparently best referred to var. *macrantha* (Wedd.) Sherff (*cf.* Bot. Ser. Field Mus. 16: 510. 1937), the principal leaves were mostly 5-partite and none simple.

Bidens perversa var. **aquilonalis** Deg. & Sherff *ex* Sherff, Amer. Journ. Bot. 31: 280. 1944.—This variety was known till now from a single collection by Ordoñez (*Degener distrib. no.* 12,919), from an altitude of 3,000 feet, Waihee, West Maui. Its range is now seen, from the following suite of specimens, to extend southward to Iao Stream (of West Maui), beyond which the species proper occurs on Puu Lio: *Otto Degener* 21,943, grassy, shrubby, precipitous slope, rare, north side of Iao Valley, *makai* of [*i.e.*, seeward from] Needle, West Maui, Feb. 26, 1952 (Amh.; Berl.; Bish.; Calif. Acad.; Chi.; Del.; Gray; Kew; Mo.; N.Y.; Par.; Phila.; U.S.).

Bidens Skottsbergii pololuensis Degener & Sherff, var. nov. —Caulis non glaucus. Folia membranaceissima, lamina lanceolato-ovata usque ovata vel rhomboideo-ovata, subgrosse usque subminute serrata (dentulis 8- ±30 pro utroque latere), apice acriter acuminata. Capitula paulo numerosiora, corymboso-paniculata, minora, involucri bracteis exterioribus saepius anguste linearibus, floribus ligulatis tantum 4 vel 5 (non circ. 8), ligulis lineari-oblongis 8-14 mm. longis et sub 5 mm. latis; achaeniis angustioribus demum vix 1 mm. latis.—Specimens

examined: *Degener & Greenwell* 21,892, on partly shaded ledges at 1,000 ft., west slope of Pololu Valley, North Kohala, Isl. Hawaii, Feb. 19, 1952 (type, Chi., my photograph no. 4,372: isotypes, Amh.; Bish.; Del.; Gray; Kew; Par.; Phila.; U.S.); *Degener & Greenwell* 21,902, on precipitous slopes and ledges, local, along ditch trail leading to Kaukini cabin on west side of Honopui (Honopue) Valley, North Kohala, Feb. 18, 1952 (topotypes, Amh.; Berl.; Bish.; Chi.; Del.; Gray; N.Y.; Par.; U.S.); *Degener, Pohina, & Iwasaki* 3,890, very much localized on partly shady, rocky canyon side along ditch trail in Pololu Valley, Mar. 22, 1930 (topotype, Chi.); *Degener & Wiebke* 2,165, west slope of Pololu Valley, Aug. 11, 1926 (topotype, Chi.).

The *Degener & Wiebke* specimen was included under var. *conglutinata* in my monograph of *Bidens* (Bot. Ser. Field Mus. 16: 119. 1937). Dr. Degener has since revisited the original site several times, collecting ample suites of specimens. These are seen to lack the rugose-coriaceous type of leaves, the more numerous (*i.e.*, 7 or 8) ligulate florets, the broader external phyllaries, etc. that are characteristic of var. *conglutinata.* Accordingly, the new var. *pololuensis* is here proposed.

In the same monograph were included (p. 118), among the specimens cited for *Bidens Skottsbergii* proper, two collections which merit fresh field-observations, since they both surely represent a hybrid with some other species. The first (*Nitta* 4,215, in *aa* lava, along railroad track 23 miles from Hilo toward Kapoho, Puna, Isl. Hawaii, Dec. 15, 1931), has the inflorescence thoroughly typical of *B. Skottsbergii*, but its subnarrowly oblong-ovate leaf-blades are too finely and numerously toothed (with as many as 36 teeth to each side). The second (*St. John et al.* 11,239, plant 4 ft. tall, open woods, alt. 200 ft., 1 mile north of Kaimu, Isl. Hawaii, Dec. 21, 1931) has the foliage typical of *B. Skottsbergii*, but its smaller, fewer-ligulate, several times more numerous, closely borne capitula reflect some other species.

Dahlia Foeniculifolia Sherff, Amer. Journ. Bot. 38: 71. 1951. —This dahlia has been known till now from a single collection made at "Dulces Nombres, Nuevo León, and just east of border into Tamaulipas, Mexico, 24° N., 99.5°-100.5° W., August 8, 1948." Recently, Dr. David Keck, Head Curator of the New York Botanical Garden, has sent me for examination

a suite of five more specimens *collected in the same general region and less than a year later: L. R. Stanford, L. A. Taylor, & S. M. Lauber* 2,130, woody-based perennial to 6 ft. tall, heads 5 inches broad, rays lavender, disk-flowers yellow, 3-5 km. south of Huitsachel, on limestone, alt. circ. 6,000 ft., Tamaulipas, Mexico, June 27, 1949 (Chi., etc.).

Chicago Natural History Museum, Chicago, Illinois.

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I. Further notes upon the flora of the Hawaiian Islands.

By EARL EDWARD SHERFF

The present paper deals with new or otherwise interesting *taxa* encountered in the course of recent determinative work upon the Hawaiian materials lent or given me chiefly by Dr. Otto Degener, by Mr. William H. Hatheway, and by the authorities of the Bernice P. Bishop Museum of Honolulu. The following genera are concerned: *Alsinodendron* H. Mann and *Schiedea* Cham. & Schlecht. (Caryophyllaceae); *Dodonaea* L. (Sapindaceae); *Labordia* Gaud. (Loganiaceae); *Euphorbia* L. (Euphorbiaceae); *Phyllostegia* Benth. (Labiatae); *Remya* Hillebr. and *Lipochaeta DC.* (Compositae).

The abbreviations used for herbaria are the same as used in the earlier Leaflets.

Alsinodendron obovatum Sherff, Bot. Leafl. no. 3: 2. 1951.—This only recently described species was based upon a single specimen, *Forbes* 1,680-*O*, Palehua, southwestern Oahu (Chi.). Among the numerous specimens recently lent me from the Bishop Museum, were several that may be cited here (all from Isl. Oahu): *O. A. Bushnell*, shrub at ridge top, alt. 2,300 ft., Piko trail, Mokuleia Forest Reserve, Feb. 4, 1934 (Bish.); *Otto Degener & John Horner* 5,930, partly wooded damp slope with little rain-fall, along summit-ridge near Palehua, Jan. 15, 1927 (topotype, Bish.); *Degener & K. K. Park* 5,928, open woods at summit, between Puu Manawahua and Palikea, Sept. 27, 1931 (Bish.); *Degener, Park, & Y. Nitta* 5,945, in forest on summit-ridge north of Makua Valley, Jul. 10, 1932 (Bish.); *R. Onouye*, shrub at 2,300 ft., semi-wet Piko trail, Waianae Mts., Mokuleia Forest Reserve, Feb. 4, 1934 (Bish.); *Yoshioka*, alt. 2,350 ft., wet forest, Kukmala Gulch, near Piko trail, Mokuleia Forest Reserve, same date (Bish.): *G. W. Russ*, Kaaikukae, October, 1929 (Bish.); *Russ*, alt. 2,500 ft., Palehua, Honouliuli, May 18, 1933 (Bish.).

Alsinodendron obovatum var. parvifolium Deg. & Sherff *ex* Sherff, *op. cit.* 3.—To the collection (*Degener et al.* 20,675, summit-ridge between Puu Manawahua and Mauna Kapu, southwestern Oahu; Chi., etc.) originally cited for this variety, may now be added the following topotype: *C. S. Judd,* alt. 2,500 ft., Honouliuli, near Manawahua, June, 1933 (Bish).

Schiedea Nuttallii Hook. **molokaiensis** var. nov. — Pumila, caule brevi (sub 2 cm.) gracillimique; foliis membranaceissimis, angusto-oblongis, utrinque acriter acuminatis, lamina 4-7 cm. longis et 1-1.5 cm. latis, caulis basim versus congregatis, petiolo tenui usque ad 7 mm. longo. Panicula minor, straminea. Sepala subulata, albido-ciliata, extus vix glabrata, circ. 3.5 mm. longa, capsula circ. 3 mm. alta.—Specimens examined: Fragment *ex herb. Hillebrandii,* Valley of Kalawao, Isl. Molokai (type, Bish. *ex* Berl., my photograph no. 4,377).

For remarks, see under var. *lihuensis* below.

Schiedea Nuttallii lihuensis var. nov.—Folia laminis anguste obovato-oblonga, utrinque acrius acuminata, principalibus ±9.5 cm. longa et ±2.7 cm. lata. Panicula minor, minus decomposita. Sepala breviter pilosa, circ. 3.5 mm. longa.—Specimens examined: *Rev. John M. Lydgate, "mauka* of Gap? near Lihue," southeastern Kauai (type, Bish., my photograph no. 4,376).

Hillebrand (Fl. Haw. Isls. 31. 1888) made special mention of the Molokai material (see var. *molokaiensis* above) and Kauai material of *S. Nuttallii.* He separated as var. *intermedia* a plant from the western end of Molokai, but left the rest of the material with the species proper, found in its typical form on Oahu. The pilose sepals of var. *lihuensis* and the diminutive proportions of the compactly leaved, dwarfish var. *molokaiensis* will at once distinguish them from vars. *Nuttallii* and *intermedia.*

Schiedea pubescens Hillebr. Fl. Haw. Isls. 31. 1888.—Hillebrand cited only "East and West Maui" for this species in its narrower sense (*i.e.,* var. *pubescens*). The islands of Lanai and Molokai may now be included in the range, as seen from these three specimens now before me: *Charles N. Forbes* 270-*L,* mountains, east end, Lanai, June, 1913 (Bish.); *Forbes* 341-*L,* Lanai, September, 1917 (Bish.); *Forbes* 424-*Mo,* Pukoo Ridge, Molokai, August, 1912 (Bish.).

The inflorescence is clammy-puberulous, as typical for the species proper, and not glabrate, as typical for the var. *lanaiensis* of Lanai.

Schiedea pubescens var. **purpurascens** Sherff, Amer. Journ. Bot. 30: 607. 1943.—Known in the past only from the Waianae Range, Isl. Oahu. The following specimens from East Maui are somewhat less purplish than the Oahu material and have leaf-blades broader and basally more rounded, but otherwise appear not to differ: *Charles N. Forbes* 230-*M*, woods east of Makawao, July, 1910 (Bish.); *Forbes* 1,274-*M*, Kula Pipe-Line, Waikamoi, Sept. 5 & 6, 1919 (Bish.).

Schiedea pubescens var. **Hillebrandii** Sherff, Amer. Journ. Bot. 30: 607. 1943.—This variety has been known until now only from the type locality of Kalae, north-central Molokai. The range is now seen to be extended eastward to Pelekunu Trail of the same island, by the following specimen: *C. N. Forbes* 237-*Mo*, Pelekunu Trail, July, 1912 (Bish.).*

Schiedea Stellarioides implexoides var. nov.—Folia oblongo-linearia usque oblongo-lanceolata vel -oblanceolata, utrinque acriter attenuata, basi vix petiolata (petiolo marginato ciliato circ. 3-5 mm. longo), lamina 5.5-9.5 cm. longa et 4-17 mm. lata. Panicula ±2.5 dm. longa et ±1.5 dm. lata, vix usque moderate diffusa, glabrata (etiam sepalis).—Specimens examined: *Abbé Urbain Faurie* 1,089, alt. 1,000 m., Waimea, Isl. Kauai, February, 1910 (Bish., my photograph no. 4,382); *C. N. Forbes (with H. J. Forbes)* 463-*K*, sea cliffs of Hanakapiai beach, northwesternmost Kauai, September, 1913 (type, Bish., my photograph no. 4,380); *Rev. John M. Lydgate*, Kaholuamanu, Isl. Kauai (Bish., my photograph no. 4,381).

The Forbes and the Lydgate specimens had been labeled at Bishop Museum as new varieties of *S. pubescens* Hillebr., but Léveillé had determined the Faurie plant originally, and apparently with better reason, as a new, broad-leaved variety of *S. Stellarioides* Mann. His varietal name given at that time in the herbarium seems, however, never to have been published.

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*The specimen, now before me, had been determined correctly to the var. *Hillebrandii* in March, 1953, by Miss Marie C. Neal, Botanist at the Bishop Museum.

An additional specimen, *Forbes* 758-*K*, rocky cliffs, Haupu, southeasternmost Kauai, Nov. 3, 1916 (Bish.) is identical as to foliage but lacks flowers and fruits, hence has been omitted from the above list.

The glabrate or subglabrous panicle might suggest the var. *lanaiensis* of *S. pubescens*, but in that variety the leaf-blades are broader, apically less attenuate and basally rounded and abruptly slender-petioled. The leaves here have a shape suggestive somewhat of that in *S. implexa* (Hillebr.) Sherff of East Maui, whence the varietal epithet.

Schiedea ligustrina Cham. & Schlecht. Linnaea 1:46. 1826. —Known heretofore only from the mountains of western Oahu. A specimen is now at hand from the Island of Kauai, *leg. Rev. John M. Lydgate* (Bish.).

Schiedea Remyi multinervia var. nov. — Caulis (ramus?) simplex, herbaceus, foliosus fere usque ad inflorescentiam, internodiis superioribus nunc 8.5 nunc 6 cm. longis. Folia oblonge elongato-lanceolata, tenuia, longitudinaliter circ. 5-nervia nervo mediano subvalido aliis debilibus, circ. 9-10 cm. longa et 1.2-1.7 cm. lata, apicem acrem versus sensim angustata, basi late sessilia. — Specimens examined: *Abbé Urbain Faurie* 1,094, *in petrosis litoris*, Hana, East Maui, September, 1909 (type, Bish., my photograph no. 4,379).

In its foliose, herbaceous stem (a single one seen, and this possibly a mere branch), this variety suggests my var. *foliosa* (Amer. Journ. Bot. 31: 153. 1944) of Halawa Valley, in northeasternmost Molokai.* In that variety, however, the leaves are but 7-9 mm. wide and at most weakly 3-nerved.

Schiedea Hookeri var. **intercedens** Sherff, Brittonia 5: 330. 1945.—Till now this variety has been known only from northwestern Oahu. Its range is now seen to extend into East Maui: *Rev. John M. Lydgate*, Haleakala (Bish.).

Schiedea Lydgatei Hillebr. — In my revision of *Schiedea* (Brittonia 5: 308-336. 1945), *S. Lydgatei* var. *Lydgatei* was attributed solely to the type locality (Kalawao) on the northern coast of eastern Molokai. Specimens are now known from

*Poor specimens of var. *foliosa* have been collected at Wailau, a few kilometers west of Halawa Valley: *Faurie* 1,086 *in rupibus litoris*, June, 1910 (Bish.).

a locality much to the southeast: *Forbes* 117-*Mo,* slopes below Puu Kolekole, July, 1912 (Bish., 2 sheets).

Schiedea Lydgatei var. **attenuata** Deg. & Sherff. — In the same revisional work (p. 332), *S. Lydgatei* var. *attenuata* was cited only for southeastern Molokai.* A specimen now before me (*Rock* 7,014, below Kalae—Bish.) extends this range to north-central Molokai.

Dodonaea sandwicensis Sherff var. **latifolia** Degener & Sherff var. nov.—Folia laminis spathulate lateque oblanceolata, apicem versus lata vel rotunde angustata, apice ipso rotundata usque acuta acuminatave, utrinque glabra, plerumque 3-6 cm. longa et 1.5-2 cm. lata; petiolo tenui vel submarginato, 2-7 mm. longo. Fructus bialati, parvi, alis inclusis tantum 8-12 mm. lati et 7-8 mm. alti, glabri, alis nitidis et viridi-stramineis, stylo brevissimi vel absenti, capsula ipsa subrubido-brunnea. Flores non visi.—Specimens examined: *Otto Degener* 21,989, an 8-foot, shrubby, rugose-leaved tree, in decadent, shrubby forest, north *mauka* of Lanai City, Isl. Lanai, Mar. 2, 1952 (type, Chi., my photograph no. 4,374: isotypes, Amh.; Bish.; Chi.; Del.; Gray; Kew; Mo.; N.Y.; Par.; U.S.).

The leaves have the salient-veiny character of *D. sandwicensis* Sherff (Amer. Journ. Bot. 32: 202. 1945), but are somewhat shorter and proportionately broader. The fruits are much smaller than in the species proper and are not wine-red in color or at all long-styled. In these latter respects the variety suggests var. *simulans* Sherff (*op. cit.* 204) of the Island of Molokai, a variety with narrower leaves. (In the field, Dr. Degener had at first construed the material as *D. sandwicensis,* but was surprised by the small, atypic fruits. Some of his labels bear the observation: "Perhaps *D. sandwicensis* genetically swamped by lowland species." This observation has seemed to me less cogent because of the known existence of the comparable var. *simulans* on another island, namely, Molokai.)

Labordia molokaiana var. **Bryanii** Sherff, Amer. Journ. Bot. 25: 585. 1938.—Till now, this variety has been known only from the Waianae Mountains, Isl. Oahu. A specimen sent me

*At one point in the text, *Faurie* 1,088 was erroneously listed as the type. *Degener* 5,937 was actually the type collection, as indeed stated a few lines down on the same page.

some time ago by Dr. Otto Degener, however, had been collected in the Koolau Mountains of the same island: *Mark Kerr (Degener's no.)* 21,662, Pupukea Trail, Koolau Range, June 22, 1947 (Chi.).

Labordia Helleri var. **macrocarpa** Sherff, Amer. Journ. Bot. 25: 582. 1938; Bot. Ser. Field Mus. Nat. Hist. 17: 527. 1939. —This variety has been known heretofore from Haupu Range of southeastern Kauai northwestward to Kaholuamanu of the same island. Its capsules were "more often 1.5-2.4 cm. long." A fine suite of specimens is now at hand from Alakai Swamp, Isl. Kauai; its mature capsules measure from 2.5 to 3 cm. in length: *Degener & Greenwell* 21,644, 6-foot, shrubby tree, in partly forested gulch, Alakai Swamp, Jan. 19, 1952 (Amh.; Arn.; Berl.; Bish.; Chi.; Del.; Gray; Kew).

Euphorbia Celastroides Boiss. **ingrata** Degener & Sherff var. nov.—Fruticosa (forsitan arborescens), ramulis ultimis rubidis tenuibus (internodiis circ. 1-1.5 mm. crassis). Folia subanguste obovata, membranacea, integra, apice rotundata usque obtusa et saepe retusa, basi cuneata usque roundata, lamina 2-3.5 cm. longa et 1-1.5 (rarius -1.7) cm. lata, glabra, sicca inferne conspicue venosa venis brunneis; petiolo gracili puberuloque circ. 2-3 mm. longo. Capitula (pauca visa) solitaria ad nodos; pedicello rigido, tenui, puberulo, circ. 1 mm. longo; involucro obconico-campanulato, costulato et puberulo vel apicem versus tomentoso, circ. 2 mm. alto; capsula sessili, viridi-brunnea, circ. 3 mm. alta, minutissime puberula.—Specimens examined: *Otto Degener* 21,967, grassy, windswept promontory, Kahakuloa, West Maui, Feb. 28, 1952 (type, Chi., my photograph no. 4,375: isotypes, Berl.; Bish.; Del.; Gray; Kew; N.Y.).

This variety is an unwelcome *(ingrata)* addition to the large assemblage of varieties already known for *E. Celastroides* Boiss. In my revision of the Hawaiian *Euphorbiae* (Ann. Missouri Bot. Gard. 25: 24. 1927), a key was given to these varieties. In that key, the var. *ingrata* would trace to the second *d* on p. 25, and to the two *g's* thereunder, *between* which it would stand because of its intermediately shaped leaf-blades.

Euphorbia Degeneri minuscula f. nov.—Forma e f. *Degeneri* foliis omnibus vel fere omnibus minoribus lamina plerumque

tantum 7-9 mm. longa et 7-12 mm. lata differt.—Specimens examined: *Otto Degener* 21,813, prostrate on clay within reach of windswept ocean spray, Kauhola Light, Hawi, Isl. Hawaii, Feb. 8, 1952 (Berl.; Bish.; Brit.; Chi.; Kew; N.Y.; Phila.; U.S.); Degener 21,966, on windswept slope near ocean, Kahakuloa, West Maui, Feb. 28, 1952 (Amh.; Bish.; Chi.; Gray; N.Y.; etc.); *Charles N. Forbes* 1,066-*O*, Diamond Head, Isl. Oahu, Jan. 26, 1909 (type, Chi.).

Euphorbia Degeneri Sherff (Bot. Gaz. 97: 583. 1936; Ann. Missouri Bot. Gard. 25: 62. 1937) was described as having leaves mostly 1-2 cm. wide, often finally turning reddish. In my earlier studies, I included as a specimen *Forbes* 1,066-*O* (Chi.), cited above. That specimen is again before me now. It has but a single pair of typical leaves, these of reddish hue and about 1 cm. long by about 1.4 cm. wide. The numerous other leaves are considerably smaller and, in view of the recent finding by Degener of similar specimens on Maui and Hawaii, appear to connote a forma worth recognizing.*

Phyllostegia parviflora var. **canescens** Sherff, Amer. Journ. Bot. 21: 700. 1934; Bishop Mus. Bull. 136: 35. 1935.—This variety was founded upon a single suite of two specimens (type, U.S., my photograph no. 2,848: isotype, Gray, my photograph no. 2,991) from West Maui. Recently a suite of material has been collected in northwestern Kauai: *Degener & Greenwell* 21,631, corolla pure white, open forest, east of Kalalau Lookout, Jan. 13, 1952 (Berl.; Bish.; Chi.).

Remya kauaiensis magnifolia* Degener & Sherff, var. nov. —Frutex plus minusve scandens, ramis elongatis tenuibus. Folia magna, petiolis gracilibus adpresse argenteo-tomentosis usque ad 2 cm. longis, laminis membranaceissimis deltoideo-ovatis usque elliptice vel deltoide oblongis, apice acutis usque acuminatis, basi (interdum obliqua) truncatis usque cuneato-contractis, margine paucidenticulatis (denticulis saepius 10-14 pro utroque latere) et saepe sinuatis, supra mox glaberrimis subnitidisque, infra densissime adpresso- et argenteo-to-

Mann & Brigham 106, from outer slope of Leahi (*i.e.*, of Diamond Head), is likewise before me (Chi., 2 sheets). It has leaves somewhat closer in size to those of f. *minuscula*, but seems too intermediate to warrant varietal status.

*Nothing in Hillebrand's original text (Fl. Haw. Isls. 193-194. 1888) was given to indicate the gender of the name *Remya* Hillebr. Accordingly, as recommended in the International Rules (adopted at Stockholm, 1950), Sect. 15, Recom. 83A (3), we have chosen a feminine gender for *Remya*.

mentosis, 7-13 cm. longis et 2.5-7 cm. latis. Pedicelli capilliformes, usque ad ±8 mm. longi. Capitula submatura depresso-globosa 2-3 mm. lata, involucri bracteis purpureo- (non atro- vel nigro-) nervatis. Flores achaeniaque non visa.—Specimens examined: *Otto Degener* 21,521, somewhat scandent shrub with very long, slender branches, very rare, on ledges over stream, along Kokee Stream near Waipoo Falls, Isl. Kauai, Jan. 3, 1952 (type, Chi., Sherff's photograph no. 4,383: isotypes, Amh.; Berl.; Bish., Sherff's photograph no. 4,384: Chi.; Del.; N.Y.).

Remya Hillebr., a genus of Compositae, is doubtless on the road to extinction. The two known species, *R. mauiensis* Hillebr. and *R. kauaiensis* Hillebr. were based of course upon Maui and Kauai specimens respectively. These were in the Hillebrand herbarium at Berlin and assumedly perished with the recent destruction of the great Berlin Herbarium in World War II. Even so indefatigable a collector and student of Hawaiian plants as Skottsberg seems never to have found a specimen of either species (*cf.* Meddel. Göteb. Bot. Trädg. 15: 528. 1944).

The present suite lacks mature flowering and fruiting heads, hence is assigned to varietal status under *R. kauaiensis* somewhat provisionally. The elongate, subflexuous, scantily foliose branches and the leaf-undersurfaces are suggestive of the probably acaulescent *Pittosporum kauaiense* var. *repens* Sherff (Amer. Journ. Bot. 28: 19. 1941) of southwestern Kauai. In that plant, however, the leaves, though similarly covered beneath with a scurfy-floccose or -strigose, exceedingly thin coating, have definitely obovate blades (as may be seen in the type photograph, Sherff photogr. no. 3,506).

Lipochaeta lavarum var. **ovata** Sherff, Bot. Gaz. 95: 88. 1933; Bishop Mus. Bull. 135: 57, fig. 18. 1935.—This variety has been known previously only from southeastern Maui in the Hawaiian Islands. A large suite of specimens of it has been collected recently in West Maui: *Otto Degener* 22,029, in small, hot, pili grass-filled gulch at 700 ft., *mauka* of McGregor, Mar. 9, 1952 (Amh.; Arn.: Berl.; Bish.; Calif. Acad.; Chi.; Del.; Goth.; Gray; Kew; N.Y.; Par.; Phila.; Univ. Calif.; U.S.).

Lipochaeta minuscula Degener & Sherff, sp. nov. — Plus minusve decumbens diffusaque, fruticosa, ramis ramulisque gracillimis saepius sub 1 mm. crassis tetragonis sulculatis antrorsum adpresso-setulosis usque ad ±2 dm. altis. Folia

(principalia forsitan non visa) opposita, setis albidis adpressis antrorsisque dense omninoque vestita, petiolo gracili 2-5 (raro -6) mm. longo; lamina tenui varie oblongo-ovata vel subhastata, 0.5-2 cm. longa, basim versus utraque latere acriter saepius 1- vel 2-lobulata lobulis dentiformibus acribusque, alibi lineari-oblonga et minutissime serrulata dentulis circ. 1-3 pro utraque latere, ad apicem minute calloso-apiculata. Capitula tenuissime pedunculata pedunculis (ramulos terminantibus) hispidulis saepius 2-4 cm. longis, radiata, pansa ad anthesin circ. 1.5 cm. lata et 5 mm. alta. Involucrum dense adpresseque antrorso-hispidum; bracteis exterioribus circ. 6-8, lineari-oblongis usque lanceolato-oblongis, 2.5-4 mm. longis. Flores ligulati flavi, circ. 8, ligula oblongo-lineari circ. 7-8 mm. longa, apice acriter denticulata. Achaenia atra, cuneata, parva, corpore tantum 2 mm. longa et 1 mm. crassa (vel exteriora interrupte alato-marginata paulum latiora), angulis apicaliter saepe inflexo-uncinulatis, apicibus 1-4-aristata aristis stramineis rectis subrectisve sub 1 mm. longis.—Specimens examined: *Mark Kerr (Otto Degener's no.)* 21,660, on ridge north of Kolekole Pass, Isl. Oahu, June 15, 1947 (type, Chi., my photograph no. 4,389: isotype, Bish.).

In my monograph of *Lipochaeta* DC. (Bishop Mus. Bull. no. 135. 1935), *L. minuscula* would go to the section Microchaete Benth. & Hook. In the key given in that work, it would trace down to "g. Plants of Hawaiian Islands" toward the bottom of page 26. From all three plants included there, it differs at once in the shape and diminutive size of its leaf-blades.

Chicago Natural History Museum, Chicago, Illinois.

II. Notes on certain Coreopsideae (Bidens L. and Coreopsis L.) of Mexico and Southeastern Africa.

By Earl Edward Sherff

For exsiccatae cited in this paper the additional abbreviation, S. Rhod. is used in reference to the Government Herbarium at Salisbury, Southern Rhodesia.

Bidens biternata var. **glabrata f. lasiocarpa** (O. E. Schulz), comb. nov.; *Bidens lasiocarpa* O. E. Schulz, Bot. Jahrb. 50, Suppl. 185. 1914.—In my monograph of *Bidens* (Bot. Ser. Field Mus. 16: 400. 1937), *Bidens lasiocarpa* O. E. Schulz was referred to *B. biternata* var. *glabrata* (Vatke) Sherff. The *B.*

lasiocarpa type (my photograph no. 1,373) then at Berlin was *Stocks* 608, from the Province of Sind (spelled also Sinde or Scinde), East India. A specimen from Southern Rhodesia is at hand: *R. W. Jack* 266, Trelawny Tobacco Research Station, November, 1944 (S.Rhod.). This is reminiscent of Schulz's type. It had been construed as probably a shade specimen of *B. pilosa* L., but the affinity with *B. bimucronata* var. *glabrata*, of which we seem required to regard it as a form, is stronger. The leaves are mostly tripartite and very thin. The exterior phyllaries are 10-15 mm. long and elongate-filiform below, thus somewhat spatulate above. The achenes are few (6-12) and all or nearly all 4-aristate, an occasional outer one curved outwardly.

Bidens paupercula Sherff, Bot. Gaz. 76: 158, pl. 12, figs. *a-g*. 1923; Bot. Ser. Field Mus. 16: 380, pl. 94. 1937.—This species has been known hitherto from "Nyassaland to southeastern Belgian Congo." A specimen before me now extends this range into Northern Rhodesia: *Anon.* 8,258, open forest, flower yellow, alt. 4,000 ft., Mufulira, May 4, 1934 (S.Rhod.).

Bidens insecta (S. L. Moore) Sherff, Bot. Gaz. 59: 309. 1915; Bot. Ser. Field Mus. 16: 580, pl. 157. 1937.—Hitherto, this species has been known to me only from a single, type specimen (*Eyles* 266, Brit., my photograph no. 526), that had been collected at Bernheim Hill, District of Mazoe, Southern Rhodesia. The Government Herbarium at Salisbury, Southern Rhodesia, contains the following additional specimens, which extend the range to perhaps 150 km. southward: *H. D. L. Corby* 680, roadside, Distr. Marandellas, Mar. 26, 1950; *Mrs. Dehn* 664, Distr. Marandellas, Apr. 22, 1942; *J. C. Hopkins*, sandveld, Rusapi, Distr. Makoni, April, 1938; *African Newton* 43, grasslands, in Msasa Topland, Distr. Marandellas, May 31, 1947.

Bidens pilosa var. **calcicola** (Greenm.) Sherff* **discoidea** f. nov.—E varietate *calcicola* f. *calcicola* ipsa capitulis discoideis non radiatis differt.—Specimens examined: *A. J. Sharp, R. E. Shanks, John N. Wolfe & Efraim Hernandez X (Expedition for correlation of flora of the southern Appalachians and Mexico-Central American Highlands)* 52,292, 3 ft. tall, heads rayless, road from San José sawmill to Gomez Farias, alt. 4,000

*Bot. Gaz. 80: 377, pl. 20. 1925; Bot. Ser. Field Mus. 16: 455, pl. 108 and pl. 109, figs. *a* and *c-j*. 1937.

ft., Tamaulipas, Mexico, Sept. 2, 1952 (type, Chi., my photograph no. 4,385).

In a previous paper (Bot. Leafl. no. 8: 22. 1953) I have described two noteworthy formae (*triaristata* and *simplex*) that only recently had come to light. The present forma was among *exsiccatae* sent me by Dr. Sharp. Originally such material was regarded by me as an extreme of *B. pilosa* L. proper (*i.e.*, of var. *pilosa*), differing in its small fruiting heads. With the recent finding of the new formae *triaristata* and *simplex*, however, it has seemed that the small-headed discoid extreme in *B. pilosa* L. would be more logically viewed as a discoid forma of the normally small-headed var. *calcicola* (outside the range of which it does not occur).

Bidens cuspidata sp. nov.—Herba sine dubio perennis, ±1.2 m. alta. Unicus caulis ramusve visus, gracilis, subquadrangulatus, sulculatus, circ. 2 mm. crassus, internodiis glabratis 6-13.5 cm. longis. Folia opposita, petiolata, petiolo marginato ±1.1 cm. longo incluso 3.5-4.5 cm. longa; lamina tripartita, supra glabrata infra adpresse plus minusve hispidula, foliolis membranaceis, lateralibus oblonge ovatis subsessilibus acriter pauciserratis apice acuto dentibusque cuspidatis ±2.2 cm. longis, terminali dimidio majore basi marginato-petiolulato, acriter in nonnullos lobulos pinnatisecto. Capitula (tantum duo visa) radiata, pansa ad anthesin ±4 cm. lata, terminalia, breviter tenuiterque pedunculata (pedunculo 2-7 cm. longo, supra adpresse setoso). Involucrum moderate hispidum, demum ±2.5 cm. latum et 1-1.2 cm. altum; bracteis subaequalibus, exterioribus 2-serialibus plus minusve oblongis longitudinaliter atro-lineatis apicem versus latioribus vel angustatis. Flores ligulati (manci) flavi, probabiliter circ. 10; tubulosi gracillimi, corolla circ. 6.5 mm. longi et (praecipue ad corollae medium) pilosi. Paleae oblongo-lineares, circ. 8-9 mm. longae et 1.2-1.5 mm. latae, siccae nitidae. Achaenia atra, obcompressa, exalata, utraque facie circ. 8-sulculata, faciebus praecipue supra marginibusque antrorsum setulosa setulis e papilla minima ortis, corpore 6-7 mm. longa et 1.5-2 mm. lata, apice erecte setuloso biaristata aristis gracilibus sub 2 mm. longis apice acerrimis infra (sub medium) antrorsum paucisetosis.—Specimens examined: *I. B. Pole Evans & J. Erens* 483, herb under trees, on road to Vila Gauveia, Portuguese East Africa, May 31, 1938 (type, S. Rhod., my photograph no. 4,387).

In my monograph of *Bidens* (Bot. Ser. Field Mus. Nat. Hist.

16. 1937), this species (of the sect. Psilocarpaea DC.) might stand as no. 178*b* on page 567.* In the general key given in that work, *B. cuspidata* would go fairly well to the first *m* on p. 70. From *B. phelloptera* given there, it differs in its smaller, shorter-petiolate leaves, fewer and coarser capitula, outer achenes not with thickened, corky margins, and in numerous other characters.*

Coreopsis Whytei S. L. Moore, Journ. Linn. Soc. 35: 348. 1902.—The type of *C. Whytei* had been collected by Alexander Whyte, no. 35, on Mount Milanji (Mt. Mlange), southernmost Nyasaland, October, 1891 (Brit., my photograph no. 735). It was inadequate for a complete technical description. A specimen now before me (*Wiehe N*1,616) was collected in the same part of Nyasaland and clearly represents *C. Whytei.* Furthermore, it is so much ampler and more satisfactory than the type that I have taken occasion to draw from it a fresh Latin description for future authors. In most respects this may well be substituted for that given in my revisional treatment of *Coreopsis* (Bot. Ser. Field Mus. Nat. Hist. 11: 377. 1936):

Coreopsis Whytei descript. amplificata: Suffruticosa, perennis, usque ad 2 m. alta. Caulis subacriter quadrangulatus, sulculatus, sicca stramineo-viridis, apicem versus tomentosus pilis pluriloculatis, alibi glaber. Folia opposita, tenuiter petiolata petiolo vix marginato 1-2.5 cm. longo tomentello pilis pluriloculatis; petiolo adjecto principalia 1-1.3 dm. longa, lamina pinnatim 5-partita, membranaceissima, numerosissime atro-glandulosa, supra minute subsparsimque adpresso-setulosa, infra pallidiora et magis conspicue adpresso-hispida; foliolis imis tenuiter petiolulatis, petiolulo 5-7 mm. longo incluso circ. 7-8 cm. longis et 2.5-4 cm. latis, circumambitu oblongo-ovatis et apice acerrimis, pinnatim plus minusve lobulatis lobulis acerrime pauciserratis dentibus cuspidatis; aliis foliolis subsimilibus sed sessilibus et saepe minoribus. Capitula subcorymbose et conferte disposita, radiata, pansa ad anthesin ±5 cm. lata et circ. 12 mm. alta, pedicellis acriter angulatis circ. 1-2 cm. longis dense tomentosis pilis patentibus multiloculatis. Involucrum hispidum, bracteis exterioribus ±8 biserialibus ovatis apice subobtusis plus minusve reflexis 3-5-

*On which same page might well stand, as no. 178*a*, *B. Lynesii* described in 1939 (*ibid.* 17: 590) from Tanganyika.

*The type specimen of *B. cuspidata*, all too scanty, had been distributed from the National Herbarium, Pretoria, Transvaal, where doubtless a better, isotype specimen is to be found.

nervatis circ. 8-9 mm. longis quam interioribus paulo brevioribus. Flores ligulati circ. 8, ligula lineari flavaque circ. 2 cm. longi, apice subintegri vel minutissime denticulati. Paleae lineares, apicem versus attenuatae, ±1 cm. longae. Flores tubulosi numerosi (forsitan 75-100), demum exserti; corolla plus minusve glabra vel ad medium hispidula, circ. 6 mm. alta, tubulo gracillimo, limbo 5-dentato; styli ramis apice caudatis. Achaenia matura deficientia; immatura obcompressa, glaberrima, nitida, circ. 4 mm. longa et fere 2 mm. lata, oblonga vel oblanceolata, omnino minutissime punctulata, utraque facie circ. 8-sulculata, marginibus (tenuibus et alis similibus) ad apicem exaristatis sed interdum in denticulum minimum productis.—*P. O. Wiehe N*1,616, herbaceous shrub up to 2 m. tall, forming societies near streams and in sheltered situations, District of Zomba, Nyasaland, Aug. 21, 1950 (S. Rhod., my photograph no. 4,388).

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ERRATA

Bot. Leafl. V: 11, line 39...for "angustior" read "angustius."

V: 13, line 6...for "Kauaiense" read "kauaiense."

V: 14, line 29...omit "Mr."

VI: 22, lines 37 and 40...for "Waialealae" read "Waialeale."

VI: 26, line 9...for "waiameae" read "waimeae."

VI: 27, line 6...for "3.5-4 mm." read "3.5-4 cm."

VII: 4, line 41...for "B. latifolia" read "R. latifolia."

VII: 7, line 24..."trigona" belongs in bold type.

VII: 9, line 18...for "these" read "umbellets."

VII: 11, line 39...for "var." read "var. β."

VIII: 12, line 41..."pupukeensis" belongs in bold type.

Index to Generic and Subgeneric Taxa*

(Leaflet numbers in Roman numerals, page numbers in Arabic)

Acacia Koa, III: 4, 6
Agalma kauaiense, VII: 10
Alectryon Mahoe, II: 4
Alsinodendron, III: 2, 3
  Lychnoides, III: 3
  obovatum, III: 2, 3; IX: 2
    var. parvifolium, III: 3; IX: 3
  trinerve, III: 3
  verticillatum, III: 3
  viscosum, III: 3
    var. laeve, III: 3
Antidesma, VIII: 15
  × kapuae, VIII: 16
  platyphyllum, VIII: 16, 17
    var. hamakuaense, VIII: 16
    var. Hillebrandii, VIII: 16
    var. subamplexicaule, VIII: 17
  pulvinatum, VIII: 16
    var. contractum, VIII: 15, 16
    var. leiogonum, VIII: 16

Bidens, III: 2; V: 14, 15, 17, 18, 20, 22, 24; VI: 2; VII: 5, 18; VIII: 22; IX: 10
  ambigua, VII: 21
  amplectens, III: 7
  bipinnata, VIII: 22
  biternata var. glabrata, IX: 11
    f. lasiocarpa, IX: 10
  cernua, VI: 5
  cinerea, V: 22
  cinereoides V: 21, 22
  connata var. connata, VI: 5
  Cosmoides, VII: 5, 6
  cuspidata, IX: 12
  × dimidiata, VII: 5, 6
  fecunda, III: 7
  gracilior, VII: 18
  Grantii var. Stapfii, VII: 19
  incumbens, V: 19, 20; VII: 18
    var. muthicola, VII: 18
  insecta, V: 19; IX: 11
  kilimandscharica var. oxymera, V: 15
  Kirkii, VII: 21
    var. flagellata, V: 15, 16
  lasiocarpa, IX: 10
  linearilobа, V: 15
  lineata, V: 16
    var. tenuipes, V: 16
  Lynesii, IX: 13
  meruensis, V: 18; VII: 19
  micrantha var. rudimentifera, III: 7
  microcarpa, VII: 19
  Napierae, V: 17
  nobilioides, VII: 20, 21
  nobilis, VII: 20, 21
  nyikensis, V: 19
  palustris var. nematocera, V: 16
  paupercula, IX: 11
  perversa var. aquilonalis, VIII: 24
  phelloptera, IX: 13
  pilosa, IX: 12
    var. bimucronata, VIII: 23
    var. calcicola, VIII: 22
      f. calcicola, VIII: 22, 23; IX: 11
      f. discoidea, IX: 11
      f. simplex, VIII: 22; IX: 12
      f. triaristata, VIII: 22; IX: 12
    var. pilosa, IX: 12
    var. radiata, VIII: 23
      f. Dondiaefolia, VIII: 23
      f. indivisa, VIII: 23
  praecox, V: 24
  reptans, VII: 18
  Rogersii, V: 19
  Rubifolia, III: 8
    var. Cuatrecasasii, III: 8; VIII: 23
  Rueppellii, V: 21
    var. incisior, V: 16, 21
  Rueppellioides, V: 20, 21
  sandvicensis, III: 8; VII: 6
    var. antrorsa, III: 8
    var. typica, III: 8
  Schimperi var. brachycera, V: 17
    var. brachyceroides, V: 17
  serrulata var. Sharpii, II: 6
  Skottsbergii, VIII: 25
    var. conglutinata, VIII: 25
    var. pololuensis, VIII: 24, 25
  squarrosa, VII: 18
  subalternans, VIII: 21
  superba, V: 16
    var. angustifolia, VII: 20
  taitensis, V: 18, 20
  tenera var. paucidentata, VIII: 23
  torta, III: 7
  torta × B. waianensis, III: 7
  triplinervia var. boyacana, VIII: 24
  ugandensis var. longisquama, V: 16
  waianensis, III: 7

Campylotheca (sect.), III: 8
Capnodium lanosum, VIII: 9
Cheirodendron, V: 2, 8; VI: 6
  Fauriei, V: 14
    var. Macdanielsii, V: 13
  Gaudichaudii, V: 13
    form γ, V: 7
    var. γ, V: 7
  Helleri, V: 13; VI: 6
    var. microcarpum, V: 14
    var. multiflorum, VI: 6
    var. sodalium, VI: 6
  kauaiense (sphalm Kauaiense), V: 13
    var. Forbesii, V: 12
  platyphyllum, V: 14
  trigynum, V: 9, 13, 14
    var. acuminatum, V: 3, 5, 11

*For main treatment of various *taxa*, see pages numbered here in bold type.

var. confertiflorum, V: 2, 4, 6, 11
var. Degeneri, V: 4
f. pauciflorum, V: 5
var. Fosbergii, V: 7
var. halawanum, V: 3, 6, 7, 14
var. Hillebrandii, V: 5, 6
var. Ilicoides, V: 10
var. molokaiense, V: 10
f. angustius (sphalm angustior); V: 11
var. multiflorum, V: 8; VI: 6
var. oblongum, V: 9; VI: 6
f. latius, V: 10
var. osteostigma, V: 12
var. Rockii, V: 8
var. Skottsbergii, V: 7; VI: 6
var. subcordatum, V: 9
Cibotium glaucum, III: 6
Colubrina, III: 5
Coreocarpus Alexandrae, II: 5
Coreopsideae, IX: 10
Coreopsis, V: 20; VI: 2, 4; VII: 18; IX: 10
Cardaminefolia, VI: 4
var. angustiloba, VI: 4
Delphinifolia, VI: 5
var. Delphinifolia, VI: 5
f. concolor, VI: 5
var. linearis, VI: 5
grandiflora var. Harveyana, VI: 3
longifolia, VI: 3
var. Godfreyi, VI: 3
major, VI: 5
var. Oemleri, VI: 4
var. rigida, VI: 5
var. stellata, VI: 4
f. Oemleri, VI: 4
f. stellata, VI: 4
Oemleri, VI. 4
saxicola, VI: 2
var. Duncanii, VI: 2
stenophylla, VI: 2
tinctoria, VI: 4
Whytei, IX: 13

Dahlia, IV: 21
Foeniculifolia, VIII: 25
Macdougallii, II: 5; IV: 21
Moorei, V: 22
pinnata, V: 23
scapigera, V: 23
Diospyros ferrea, II: 4
Dipanax, VII: 10
dipyrena, VII: 11
gymnocarpa, VII: 12
kauaiensis, VII: 10
Mannii, VII: 11
Dodonaea eriocarpa var. eriocarpa, VIII: 15
var. typica, VIII: 15
sandwicensis, IX: 6
var. latifolia, IX: 6
var. simulans, IX: 6
viscosa var. arborescens f. spatulata, VIII: 15
Dubautia laevigata, VII: 3, 4
latifolia, VII: 4
laxa, VII: 3, 4
× mendacoides, VII: 3, 4
× mendax, VII: 3, 4
paleata, VII: 3
× paludicola, VII: 3
waialealae, VII: 3

Ebussa (sect.), V: 24
Epiphytum (sect.), IV: 21
Euphorbia, III: 2
Celastroides, III: 5; IX: 7
var. amplectens, III: 5
f. kahanana, III: 5
var. Hathewayi, III: 4, 5
var. Hillebrandii, III: 4
var. Humbertii, III: 5
var. ingrata, IX: 7
var. kaenana, III: 5
var. niuensis, III: 5
var. saxicola, III: 5
Clusiaefolia var. grandifolia, II: 4
Degeneri, IX: 8
f. Degeneri, IX: 7
f. minuscula, IX: 7
Forbesii, II: 4
Hillebrandii, III: 5
multiformis, III: 5
Rockii, II: 4
Euphorbiae, IX: 7
Eutetraplasandra (sect.), VII: 11; VIII: 12

Fouquieria, II: 6

Gnaphalium sandwicensium var. kilaueanum, VIII: 21

Heptapleurum, VII: 11
dipyrenum, VII: 11
kauaiense, VII: 10, 11
Heterosperma Xantii var. Carterae, II: 6

Jatropha, II: 6

Labordia, III: 2
Fagraeoidea var. Hillebrandii, III: 5, 6
f. subcalva, III: 5, 6
var. multinervia, III: 5, 6
Helleri var. macrocarpa, IX: 7
molokaiana var. Bryanii, IX: 6
Lantana, III: 5
Lipochaeta, IX: 10
heterophylla var. molokaiensis, VII: 2
lavarum var. ovata, IX: 9
minuscula, IX: 9
Rockii, VII: 2
var. subovata, VII: 2

Microchaete (sect.), IX: 10
Maba, IV: 20
Meduseae (sect.), III: 8
Metrosideros, III: 4
polymorpha, III: 6
Metroxylon, VIII: 19
Mimosa, II: 6
Munroidendron, VII: 21
racemosum, VII: 22, 23
var. Forbesii, VII: 23, 24
var. Macdanielsii, VII: 24
var. racemosum, VII: 23, 24
Myoporum, III: 4
Myrsine, III: 4

Neocaulon (sect.), IV: 21
Neotetraplasandra (sect), VIII: 12
Nothotetraplasandra (sect.), VII: 11; VIII: 12
Nototrichium, I: 2; III: 2; IV: 2
  humile, I: 4; IV: 3, 19
    var. parvifolium, I: 4; IV: 3, 19, 21
    var. subrhomboideum, I: 4; IV: 3, 19, 20
    var. typicum, I: 4; IV: 19
  sandwicense, I: 2; IV: 3, 4, 5, 8, 9
    var. decipiens, II: 2; IV: 3, 5, 14, 17
    var. dubium, II: 2; IV: 3, 4, 11
    var. Forbesii, II: 2; IV: 3, 4, 9
    var. Helleri, I: 3; II: 2; IV: 3, 4, 14, 17
    var. kauaiense, I: 3; IV: 3, 5, 16
    var. kolekolense, I: 3; IV: 3, 6, 13
    var. lanaiense, I: 3; IV: 3, 5, 15
    var. lanceolatum, I: 3; IV: 3, 4, 15
    var. latifolium, I: 3; IV: 3, 5, 12
    var. leptopodum, I: 2; IV: 3, 5, 15
    var. longespicatum, IV: 3, 4, 9
    var. macrophyllum, I: 2; IV: 3, 5, 12
    var. mauiense, II: 3; IV: 3, 6, 14
    var. olokeleanum, II: 3; IV: 3, 5, 12
    var. pulchelloides, III: 2; IV: 3, 8
    var. pulchellum, II: 3; IV: 3, 6, 8
    var. subcordatum. I: 3; IV: 3, 4, 8, 10
    var. Syringifolium, I: 2; IV: 3, 4, 10
    var. typicum, I: 2; IV: 4, 8, 10, 11
  viride, IV: 3, 7, 17
    var. oblongifolium, II: 3; IV: 3, 17, 19
    var. subtruncatum, II: 4; IV: 3, 17, 18
Nototrichium (sect.), IV: 2

Ochrosia, III: 5

Phyllostegia, III: 2; VII: 6, 7; VIII: 18
  brevidens and vars., VIII: 18
    var. heterodoxa, VIII: 17
    var. hirsutula, VIII: 18
  grandiflora var. hirsutula, VIII: 18
  macrophylla var. velutina, VIII: 17
  mollis, VIII: 19
    var. glabrescens, VII: 7
    var. Hochreutineri, VIII: 18
    var. resinosa, VIII: 19
    var. Skottsbergii, VIII: 18, 19
  parviflora var. canescens, IX: 8
  racemosa, III: 6
  vestita, III: 6
Pittosporum, III: 2, 4; VIII: 13
  cladanthum, III: 4
  confertiflorum, III: 4; VIII: 13
  dolosum var. aquilonium, VIII: 13
  kauaiense var. repens, IX: 9
  sulcatum var. Remyi, III: 4
    var. Rumicifolium f. tomentellum, III: 4
Platycarpaea (sect.), III: 8
Pseudodendron (sect.), IV: 21
Psidium, IV: 20
Psilocarpaea (sect.), III: 8; IX: 13
Psilotrichum sandvicense var. kauaiense, IV: 16
Psilotum sandwichense, IV: 4
Psilotus (Nototrichium) sandwicensis, IV: 8
Pterotropia, VII: 10, 11
  dipyrena, VII: 11, 13, 14
  gymnocarpa, VII: 12
    var. pupukeensis, VIII: 13
  kaalae, VII: 11
  kauaiensis, VII: 10, 11
    var. (in reality var. β), VII: 11
    var. β, VII: 16
Pterotropia (sect.), VII: 10
Ptilotus sandwicensis, IV: 4, 10
    var. α, IV: 4, 8
  (Nototrichium) sandwicensis, IV: 8
    var. kauaiensis, IV: 16
Railliardia, VII: 4
  latifolia, VII: 4, 5
    var. Helleri, VII: 5

Remya, IX: 8
  kauaiensis, IX: 9
    var. magnifolia, IX: 8
  mauiensis, IX: 9
Reynoldsia, VI: 6, 7, 9, 15; VII: 7
  Degeneri, VI: 7, 9, 11, 15
  Hillebrandii, VI: 7, 8, 11
  Hosakana, VI: 7, 8, 18; VII: 17
  huehuensis, VI: 7, 8, 12
    var. brevipes, VI: 7, 8, 13
    var. intermedia, VI: 7, 8, 13
  mauiensis, VI: 7, 9, 16, 17
    var. macrocarpa, VII: 17
  oblonga, VI: 7, 17
  pleiosperma, VI: 7, 9
  sandwicensis, VI: 7, 8, 9, 10, 12, 15, 17
    var. intercedens, VI: 7, 9, 10; VII: 17
    var. molokaiensis, VI: 7, 8, 11, 16
    var. sandwicensis, VI: 9, 11
  venusta, VI: 7, 9, 11, 13
    var. lanaiensis, VI: 7, 9, 14

Sapindus oahuensis, IV: 18
Schiedea, VII: 6; IX: 5
  diffusa, VII: 6
  Hookeri var. acrisepala, II: 4
    var. intercedens, IX: 5
  implexa, IX: 5
  ligustrina, II: 4; IX: 5
  ligustrina × S. Hookeri var. acrisepala, II: 4
  Lydgatei, IX: 5
    var. attenuata, IX: 6

var. Lydgatei, IX: 5
Nuttallii, VII: 6
var. intermedia, IX: 3
var. lihuensis, IX: 3
var. molokaiensis, IX: 3
var. pauciflora, VII: 6
pubescens, IX: 3
var. Hillebrandii, IX: 4
var. lanaiensis, IX: 4
var. pubescens, IX: 3
var. purpurascens, IX: 4
Remyi, VIII: 14
var. foliosa, IX: 5
var. multinervia, IX: 5
Stellarioides, IX: 4
var. implexoides, IX: 4
Sophora, V: 24
chrysophylla, V: 24, 25
var. unifoliata, V: 24
grisea, V: 24
unifoliata, V: 24
tomentosa, V: 24
Steppia (sect.), V: 21
Stenogyne, VIII: 20
Calaminthoides, VIII: 19
var. oxyodonta, VIII: 19
diffusa, VIII: 21
var. glabra, VIII: 21
kaalae, VIII: 21
oxygona VIII: 20, 21
sessilis, VIII: 19
Sherffii, VIII: 21

Tagetes, VI: 25
Tetraplasandra, VI: 19, 25; VII: 7, 8, 10, 11, 23; VIII: 2, 3, 12
bisattenuata VI: 26
Elstonii, VI: 25
gymnocarpa, VII: 12, 16; VIII: 7, 13
var. leptocarpa, VII: 15
var. megalocarpa, VII: 15
var. pupukeensis, VIII: 12
hawaiiensis, VIII: 7, 12
var. awiniensis, VI: 37, 38
var. gracilis, VI: 38
var. microcarpa, VI: 38
kaalae var. multiplex, VIII: 11
kahanana, VIII: 6, 7
kauaiensis, VII: 10, 11, 12; VIII: 7
var. dipyrena, VII: 11, 13
var. grandis, VII: 14
var. intercedens, VII: 13, 14
var. kauaiensis, VII: 13
var. koloana, VII: 12
var. nahikuensis, VII: 13, 14
var. occidua, VIII: 7
var. robustior, VII: 12
kohalae, VI: 35
lanaiensis, VII: 8
lihuensis, VIII: 8, 9
var. gracilipes, VIII: 9
Lydgatei, VI: 19
var. brachypoda, VI: 19, 21, 22
var. coriacea, VI: 21
var. Forbesii, VI: 20, 21
var. leptorhachis, VI: 20, 21, 22
var. Lydgatei, VI: 20, 22
meiandra, VIII: 3, 6, 7, 11
var. δ, VI: 28, 30
var. ζ, VI: 34
var. bisobtusa, VI: 36
var. Bryanii, VIII: 10, 11
var. Degeneri, VI: 27
var. hailiensis, VII: 10; VIII: 6
var. Hillebrandii, VI: 28, 31
var. hiloensis, VI: 34
var. leptomera, VI: 30
var. longipedunculata, VIII: 3, 11
var. makalehana, VI: 36, 37
var. mauiensis, VI: 29
var. molokaiensis, VI: 28
var. meiandra, VIII: 7
var. olowaluana, VI: 37
var. ovalis, VI: 31; VII: 9
var. polyantha, VI: 28
var. polystigmata, VII: 9
var. prolifica, VI: 32
var. prolificoides, VI: 33
var. ramosior, VI: 36
var. rhynchocarpa, VI: 33; VII: 8, 9; VIII: 10
var. rhynchocarpoides, VII: 8
var. Rockii, VI: 33
var. simulans, VI: 35
var. Skottsbergii, VI: 28, 29
var. tenuistylis, VI: 35; VIII: 10
var. tenuistyloides, VIII: 10
micrantha, VII: 11, 16
Munroi, VII: 7, 8
oahuensis, VIII: 3, 5, 6
var. β, VIII: 4
var. eradiata, VIII: 5
var. Fauriei, VIII: 3
var. hailiensis, VIII: 6
var. longipes, VIII: 4
var. pseudolongipes, VIII: 4
var. pseudorhachis, VIII: 3
var. venulosior, VIII: 2, 3, 8
pupukeensis, VII: 7; VIII: 3
var. decipiens, VIII: 8
var. megalopoda, VI: 40; VIII: 3, 8, 11
f. trigona, VII: 7; VIII: 8
var. nitida, VI: 39
var. venosa, VI: 40
racemosa, VII: 22, 23
turbans, VII: 16
waialealae, VI: 22, 23, 25, 27; VIII: 9
var. acrior, VI: 22, 23
var. subsessilis, VI: 23
var. urceolata, VI: 23
var. wahiawensis, VI: 24, 26
var. waialealae, VI: 22
waianensis var. palehuana, VIII: 11
waimeae, VI: 23, 25, 26; VIII: 12
waimeae (sphalm waiameae)
var. angustior, VI: 26

Vicia villosa, VII: 24
f. rosea, VII: 24
f. villosa, VII: 24

Triplasandra kaalae, VIII: 5, 6, 12
meiandra var. β, VI: 36
var. γ, VI: 36
var. δ, VI: 28, 29
var. ζ, VI: 34

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